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A TREATISE

ON

INDIGESTION

AND ITS CONSEQUENCES,

CALLED

NERVOUS AND BILIOUS COMPLAINTS;

WITH

OBSERVATIONS

ON

THE ORGANIC DISEASES,

IN WHICH THEY SOMETIMES TERMINATE.

BY A. P. W. PHILIP, M. D. F. R. S. Ed. &c.

THIRD EDITION,

WITH SOME ADDITIONAL OBSERVATIONS.

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TO THE

PRESIDENT,

FELLOWS AND LICENTIATES,

OF THE

ROYAL COLLEGE OF PHYSICIANS

OF LONDON,

THE FOLLOWING TREATISE

IS RESPECTFULLY DEDICATED

BY A MEMBER,

WHO IS DEEPLY IMPRESSED WITH THE ADVANTAGES WHICH THE PROFESSION OF MEDICINE HAS DERIVED FROM THE INSTITUTIONS, AS WELL AS THE SCIENCE, OF THAT COLLEGE.

5, Hanover Square,
November, 1821.

GIFT
ESTATE OF
WILLIAM C. RIVES
APRIL, 1940

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PREFACE

TO THE

FIRST EDITION.

My chief objects in the following Treatise have been to give arrangement to the various affections which have been termed nervous and bilious; to ascertain the nature of the disease on which they depend; to trace the causes which determine them to assume the various forms in which they are presented to us, and to determine the appropriate treatment of each of these forms.

In enumerating the symptoms, I have been led to enter more fully than, I believe, has hitherto been done, into the manner in which the sympathy of parts influences the phenomena and treatment of diseases, and thus to endeavour to ascertain some of the laws by which it is regulated.

An attempt has been made to distinguish the symptoms which are the more immediate effects of the remote causes, from those which arise from the continuance of the disease itself, and to show, that on a correct knowledge and consequent discrimination of these two classes of symptoms, the successful treatment, in a great degree depends.

My attention has been particularly directed to the latter, by which the changes which take place in the progress of the disease are indicated. I have endeavoured to ascertain the nature of these changes, and the manner in which they influence the various functions, and at length, in many instances, destroy the organization of some vital part.

The adaptation of the means of cure to the changing nature of the disease, has been constantly kept in view; for similar trains of symptoms, at its different periods, we shall find, require different, and sometimes even opposite, means of cure.

I have attempted to point out the influence of regimen, and to determine the rules by which the employment of mercury, which, we have reason to believe, has become too indiscriminate in this disease, should be regulated, and the limits at which its beneficial, no longer counterbalance its injurious, effects.

In the composition of the following Treatise, recourse has not been had to the works of others. It can not, therefore, be regarded as an attempt to present to the reader the sum of our knowledge on the subject. I offer it simply as the result of my observations, and the reflections suggested by them, during a space of twenty-five years.

PREFACE

TO THE

SECOND EDITION.

In revising the following Treatise, the author's only object has been to render it more useful to the practitioner.

As hardly half a year has elapsed since its publication, any considerable enlargement of it is not to be expected; but he hopes that the present edition will be found in several respects improved. Many observations have been added, and an attempt has been made, in several passages, to explain more fully the principles which led to the treatment recommended in it, the author's confidence in which, he is happy to say, has been strengthened since the appearance of the first edition, by communications from several physicians, to some of whom he has not the honour of being personally known.

For the sake of hasty readers, who seldom see arrangement in a work where the subject is at all complicated, without numerous divisions and references, the author has introduced a greater number of these, which, to the diligent who bear in mind the plan laid down and feel no difficulty in perceiving how the different parts of the subject arrange themselves under it, are often superfluous, and therefore unwelcome interruptions.

A TREATISE

ON

INDIGESTION, &c.

It is a remarkable fact, that there is hardly any disease less understood than that which is most frequently presented to us, and known under the vague denominations of bilious, nervous, and stomach complaints; which seems the more extraordinary, because there is none of greater importance, whether we regard its variety, its consequences, or its connexion with other diseases.

This arises, I believe, from two circumstances. The first relates to the nature of the disease itself. In its early stages, in which other fatal diseases sometimes give us an opportunity of examining the organs chiefly affected, the cause of derangement is in parts too minute for observation; and before its fatal termination, it is so changed, that the inspection of those who fall a sacrifice to it, throws little light on its origin. Who, for example, can learn from the appearances in the body of a drunkard, what particular state of the parts concerned caused the dyspeptic symptoms, which preceded the indurated liver, and distended abdomen? The second circumstance to which I allude, relates to the causes of the disease. We know that the digestive power of the stomach, depends on a fluid secreted in it, and consequently, that a deranged state of this fluid must be the cause of the symptoms of Indigestion; but we can make little practical use of this knowledge, unless we know the immediate causes of its derange-

ment, and the particular manner in which the derangement operates in producing the symptoms of the disease. These are the questions which chiefly interest the physician; and yet, as far as I know, no attempt has been made to answer them; and the practice in this disease remains uncertain and ill defined.

My attention has frequently been arrested by finding, that cases, in which the usual means, in many instances successful, had failed, and indeed often aggravated the symptoms, yielded readily to an opposite plan. Cases relieved by opposite plans of treatment, it is evident, can not be of the same nature, however similar their causes and symptoms. They are either different diseases, or different stages of a disease, whose nature undergoes some change in its progress.

I have arranged the various cases, of which I am about to treat, under the denomination of Indigestion, because the symptoms of this derangement form a more or less prominent feature in all, and all begin with these symptoms. I prefer this term to dyspepsia, which has been employed by medical writers to express a disease much less varied, and of much less extent than that I am about to treat of. Indigestion, therefore, in the sense in which I shall use this term, is not synonymous with dyspepsia, but includes it.

The following Treatise may be divided into four parts:—In the first, I shall present to the reader, a review of the symptoms of Indigestion, and its more immediate consequences; in the second, consider the remote causes of this disease, the manner in which they excite it, and the nature of the changes which take place in its progress; in the third, detail the plans of treatment which have appeared to me most successful in it; and in the last, make some observations on the symptoms and treatment of the organic derangements, in which it often terminates.

By a disease we mean, not only that collection of symptoms which are present at any one time, but also those which appear in succession, arising from the same source. We shall find Indigestion the most varied of all diseases. Beginning from simple and apparently unimportant deviations from health, it gradually

becomes so complicated, and often, at length, so undermines every power of the system, that it is difficult to give a view of its symptoms, which shall be at once sufficiently full and distinct. It is an affection of the central part of a most complicated structure, capable of influencing even its remotest parts, and each, through many channels, and in various ways.

CHAPTER I.

OF THE SYMPTOMS OF INDIGESTION.

I SHALL divide the symptoms of indigestion into three stages. While this division renders the account of them more distinct, it at the same time answers a more important purpose, for we shall find the disease in these stages varying in its nature, as well as in its symptoms.

Of the Symptoms of the First Stage.

The first symptoms of Indigestion are either such as immediately arise from the undigested food itself; or from the state of the stomach and bowels, which causes the disease, and the irritation of their nerves, occasioned by the undigested food, or their own vitiated secretions.

The symptoms which immediately arise from the undigested food are flatulence, distention of the stomach and bowels, and acid, oily and putrescent eructations.

From the debility of the stomach and bowels, and irritation of the nerves, a greater variety of symptoms spring. Organs of such importance in the animal economy can not long be so deranged as to produce vitiated secretions, without at the same time, giving rise to other disturbance in the system. The debility of stomach, which prevents a due secretion of healthy gastric fluid, must at length, produce some of those other effects which we witness, when the powers of the stomach are disordered by any offending cause.

An emetic, while it remains on the stomach, destroys the appetite, occasions nausea, sometimes pain, and produces, in consequence of the sympathy which exists between the stomach and every other part of the system, a general state of debility, now and then almost approaching to syncope. The surface is pale, cold, and shrunk, and the action of the heart is impaired, the pulse becoming small and feeble. The limbs perhaps tremble, and are always unequal to their usual exertions, and the mind is anxious and subdued. These symptoms, however, disappear as soon as the act of vomiting relieves the stomach from the offending cause.

When we consider that the causes which disorder the powers of the stomach in Indigestion are of a more permanent nature, and that the contents which irritate its surface, although often removed, as in the case of the emetic, are soon reproduced, we shall find little difficulty in perceiving the general rationale of the symptoms of this disease. But, in order more particularly to ascertain the state of the stomach and bowels in its various stages, it will be necessary to take a closer view of its symptoms, and attempt a more minute investigation of their immediate causes.

The symptoms which arise immediately from undigested food, exist in various degrees in different cases. In the very commencement of the disease, they are often the only symptoms which occasion much uneasiness, from which it appears, that the functions of the stomach may, for a certain time, be so disordered as to produce a feeble, or otherwise vitiated secretion, without in any other way very sensibly affecting the functions of the system. People frequently complain of a sense of distention after eating, and flatulent and acid eructations, who notwithstanding, enjoy good general health; and find that even these symptoms may be prevented by taking less food, and that of a more digestible quality; and, if they are prudent in this respect, and the constitution is otherwise sound, and not exposed to the effects of indolence, and other causes weakening the nervous system, the stomach will often recover its powers without further means.

In the majority of cases, however, either from neglect on the part of the patient, or a greater degree of obstinacy in the cause,

the above symptoms continue to recur. This never happens for any great length of time, without the other parts of the alimentary canal partaking of the disease. Their secretions also begin to suffer some deviation from the healthy state. Those of the intestines, for the most part, are impaired in quantity, and, at the same time, probably altered in quality. The bowels do not act so readily as usual, and they are occasionally distended and tense, especially some time after eating. The mouth is clammy, and the tongue more or less furred, particularly in the morning.

But these symptoms, the patient finds, yield to some mild aperient, which, at the same time, promotes the action of the stomach, and his feelings on the whole, differ but little from those of health. He is more apt to be thirsty, his appetite is generally more or less impaired and variable. he complains of his feet being cold, but still his strength, and general appearance, are but little affected, and he seldom thinks it necessary to pay particular attention to symptoms which appear so slight, and for the time yield so readily.

By degrees, however, they recur more frequently, and begin to be attended with some depression of strength which at first is only occasional. This, in general, is the first thing which seriously calls his attention to the disease. The mind, if the disease proceed, partakes of these returns of languor, and the patient at length finds it difficult at all times to command his attention, and upon the whole, that he is not capable of his usual mental efforts. His sleep is disturbed by perplexing dreams, and sometimes by fits of nightmare. In a large proportion of cases, however, he enjoys good nights, and even those who are troubled with dreaming and restlessness, often feel more drowsy than usual.

He now becomes alarmed, and occasionally feels a degree of despondency. Instead of thinking too lightly of his complaint, he often regards it in the most serious point of view, and can not be persuaded that any thing less than some important derangement, can produce the anxiety and depression by which his attention gradually becomes wholly engrossed; for none but an attentive physician can know how slight a derangement of the alimen-

tary canal, especially after the habit of disease is formed, is capable of essentially influencing every function of the system.

While the symptoms thus proceed, a change, sooner or later, takes place, which marks an important step in the progress of the malady. The alvine discharge begins to deviate from the healthy appearance: it sometimes contains uncombined bile, sometimes it chiefly consists of bile; its colour at other times is too light, more frequently too dark; and occasionally, at length, almost black; at different times it assumes various hues, sometimes inclining to green, sometimes to blue, and sometimes it is mixed with, and now and then almost wholly consists of, undigested bits of food. When there is much straining, it often contains mucus in distinct masses, and not unfrequently, substances resembling bits of membrane. It frequently separates from the canal with more difficulty than usual, and leaves a feeling of the bowels not having been completely emptied

We have reason to believe that the above change and variety of colour arise chiefly from the state of the bile, to which the alvine discharge owes its natural tinge, being quite white, when no bile flows into the bowels. It would appear that the properties of the bile are sometimes changed without change of colour; but this is comparatively so rare, that if the colour of the alvine discharge be natural, we may generally infer that the function of the liver is duly performed.

The disease has hitherto been what is called stomach complaints. It is now, from the various appearances of the vitiated bile, and the various symptoms which arise from the irritation it occasions in the alimentary canal, what is called bilious and nervous complaints. The former of the two last appellations has also arisen from the bile, of which there is sometimes a superabundant secretion, being, occasionally, in consequence of the inverted action of the duodenum, thrown into the stomach; and there exciting nausea, headache, and bilious vomiting.

Many conceive that the changes of colour in the alvine discharge are often to be ascribed more to circumstances in diet, and changes which the contents of the bowels undergo in their

passage through this canal, than to the state of the bile; and, I have no doubt, these causes operate to a greater or less extent. The long delay of their contents in the bowels generally darkens the colour; a milk diet produces a discharge of a lighter colour than one consisting chiefly of animal food, and some vegetables and medicines communicate a certain tinge to the discharge. According to my experience, however, these causes, on the whole, produce less effect than might be expected, and, with a little attention on the part of the practitioner, will seldom mislead him. It must always be kept in view, that the appearance of the discharge often changes, when it has remained for some time out of the body.

The urine also deviates from the healthy state. In its most healthy state, it is perfectly transparent when passed, and remains so after it cools, its colour being more or less deep in proportion to the degree in which its contents are diluted. It is, however, liable to some deviations from this state under circumstances which can hardly be said to affect the general health.

It appears from some experiments which I made many years ago for the purpose of ascertaining the effects of various circumstances in diet, &c., on the state of the urine, an account of which the College of Physicians of London did me the honour to publish in the last volume of their *Transactions*, that when acid greatly prevails in the stomach and bowels, or the skin becomes more inactive than usual, so that it does not freely throw off the acid, which it appears from these experiments always passes by this organ, a red deposition, which consists of lithic acid, takes place from the urine after it has stood for some time, this fluid still remaining clear; and on the other hand, that, when the skin has been unusually excited, or an alkalescent state of the stomach and bowels prevails, it becomes turbid, and deposites a white sediment, which has been ascertained, by the experiments of Dr. Wollaston, to consist of the phosphates of the urine.

Both these states, particularly the former, are more apt to appear in indigestion than in ordinary health; and the urine in this disease is sometimes covered with a very thin oily film, which

appears to arise from an imperfect state of the assimilating process Sometimes also it is limpid, and passed in unusually large quantities, more frequently scanty and too high coloured. It is then most apt, as we should *a priori* expect, to deposite the above sediments unless some degree of fever prevail, when it often either deposites nothing, or a little of the red sediment.

A remarkable sympathy between the state of the kidneys and intestines is often observed in Indigestion, the urine remaining scanty and high coloured, when the bowels are constipated; and flowing freely, and of a paler colour, as soon as a free discharge from them has been obtained. Even in those dropsical affections which supervene on this disease, it is common for all diuretics to fail when the bowels are constipated, and for the operation of cathartics alone to be followed by a free discharge from the kidneys.

The copious flow of urine which sometimes attend Indigestion seems frequently to arise from a failure in the action of the skin, as appears from some of the experiments just referred to. The kidneys and skin separate the same fluid from the blood, and a failure of secretion from the latter is often compensated by an increase of that from the former, if they have not by sympathy partaken too much of the state of the skin. Thus in dyspeptics an unusual application of cold to the surface, when the powers of the system are not able so to re-act as to support the due action of the skin under it, frequently occasions an increased flow of urine.

The same cause often occasions a greater discharge from the bowels. It particularly demands attention in this disease, that, although the increased discharge from the bowels in the instance before us is of a watery nature, when the skin has, from the state of that disease, become uniformly languid, the increase is often in the solid, as well as liquid, contents of the bowels. On the same principle, the quantity which passes from the bowels of delicate children when the skin has become dry and shrivelled, is often astonishing, and that even when little nourishment is received, as if not only what ought to have passed by the skin, but a great

deal of what has been inhaled by this organ were deposited in a solid form in the alimentary canal. Some facts would lead us to suppose that in such a state of the skin, the inhalation by it is often very great. I have seen several gallons of water drawn off from a child ten or twelve years old, labouring under extensive abdominal disease, and apparently re-collected in eight or ten days, although but little fluid had been taken.

What is here said is well illustrated by an opposite state of the system. In very great eaters, the alvine discharge is often no greater than in other people, but the secretion by the skin is found much more free. Even in a remarkable case of this kind, an account of which appeared in the journals of the day (1797) in which an individual could eat daily twelve or fifteen pounds of raw meat, and would have starved if confined to the allowance of two or three ordinary men, the alvine discharge was little, if at all, greater than usual, yet he continued thin, and the superfluous quantity of food ran off by profuse night-sweats.

The sensible change in the appearance of the alvine secretions in Indigestion, is generally attended with some change in the other symptoms. The stomach is more apt to be oppressed after eating, the patient often observing that he feels as if there were not room for what he had taken. The bowels are frequently variable, diarrhœa often supervening without any evident cause, almost uniformly followed by fits of constipation. These, the patient finds, can not now be removed by the simple medicines which at first restored due action to the bowels, larger doses or more active medicines are necessary, and their effect corresponds with the previous state of the bowels. The discharge is generally unsatisfactory, something seeming to be retained. It is very often watery, or frequent small semi-fluid, teasing, mixed with mucus, and sometimes streaked with blood, and after it has been repeated, often chiefly consists of mucus and a little blood, the passage of which is attended with much griping and bearing down, and followed by a constant desire of further evacuation. The patient takes more medicine, with the hopes of a freer effect, but he thus often increases the straining more than the discharge.

After this state of irritation has continued to recur for a great length of time, a degree of permanent spasmodic stricture sometimes appears to take place in the rectum. This I have known happen to such a degree as to give a tape-like appearance to the alvine discharge for many months without intermission, and suggest the idea of organic stricture, till an examination of the part proved its real nature. A more temporary contraction of the rectum, occasionally giving this appearance to the discharge, is not an uncommon symptom.

In the meantime the patient is harassed with a variety of other symptoms, arising from the irritation occasioned by the morbid contents of the alimentary canal, increasing languor, pains of the stomach, more frequently of the bowels, and particularly of the lower part of the bowels, sometimes continued, generally of the griping kind, a sense of heat, or, as the patient often calls it, burning, referred to the stomach, and now and then extending to the bowels, which sometimes proves the most obstinate and distressing symptom of the disease, or of weight in the right hypochondrium or lower part of the abdomen, with unusual distention of the former, sometimes disappearing in a day or two, particularly after freer evacuations, and returning again, at other times more stationary, a more foul and clammy tongue, nausea, more rarely vomiting, a depression of strength, which sometimes, particularly after the unsatisfactory operation of cathartics, almost amounts to syncope, and a despondency that is hardly equalled in any other disease.

As these symptoms proceed, others, the consequence of the sympathy which exists between the stomach and other parts of the system, gradually show themselves. These are different in different parts, and other complaints, of the head, affections of the sight, the hearing, smell, or taste. More or less habitual inflammation, and even ulceration of the throat are by no means uncommon, and the voice and articulation are sometimes variously affected. The patient is distressed with spasms of the trunk or limbs, numbness, and even temporary loss of power in the lat-

ter; and feelings of endless variety are described as sometimes in one part of the body and sometimes in another.

By constant recurrence of such attacks without being uniformly ill, for the rapidity with which the patient rallies is often as great as that with which he is subdued, he is gradually rendered unfit for the active duties of life. This preys on his mind, increasing the despondency which makes a part of his disease, and which in its turn, by further debilitating the digestive organs, aggravates all the symptoms.

These organs being no longer in a proper state to supply due nourishment, the body becomes emaciated, and more permanently feeble, the strength by degrees rallying less readily and less perfectly after the frequent returns, and what was at first only a temporary depression from a debilitating cause affecting the nerves of the alimentary canal, is gradually changed into real debility, the countenance, which is almost always a sure index of what is passing internally, becoming pale and haggard.

It is of great importance in judging of the state of this disease to distinguish between debility and what may be called depression of strength. In the latter the action of the vital powers is only impeded, in the former their vigour is impaired. The one may supervene in a moment, and may be as instantly relieved; the other, unless the cause be very powerful, comes on more slowly, and in all cases slowly removed. We have an instance of depression of strength in the effects of an offending cause in the stomach and bowels, which cease as soon as the cause ceases to operate; of debility in the effects of repeated irritation of these organs, which continue after the cause of irritation no longer exists. Thus the debility, which appears suddenly at the commencement as well as at other periods of Indigestion, is of trifling importance, compared with that more permanent debility which supervenes gradually, the symptoms of which are often slight compared with those of temporary depression of strength, but which is always more difficult of cure. The one is chiefly important as it indicates what is passing internally; the other proves that the powers of the constitution are

yielding to the disease. Either mistaken for the other leads to serious errors in practice.

The patient, often from an early period of Indigestion, feels some uneasiness on lying on the left side, more rarely this is the case with respect to the right side. In the progress of the disease, lying on either side becomes uncomfortable, and, in its advanced stages, the only easy position is on the back, with the shoulders a little raised, and generally inclined to the right side.

Such is the general course of the disease we are considering. Those who are acquainted with the laws of sympathy, which in so striking a manner modify the phenomena of disease, will expect, that in the parts which most sympathize with the stomach and bowels, and consequently partake most of their affections, the symptoms of this disease will be found most varied. Thus it is that the tongue and other parts of the mouth are variously affected from the commencement. Their secretions become more and more thick and clammy, the former being covered with a white or brownish mucus, which also more or less adheres to, and irritates the fauces; sometimes all these parts are more or less parched and stiff, at other times the saliva is morbidly thin and copious, the tongue being cleaner but often of a whitish and sodden appearance. In protracted cases when the symptoms have been rather obstinate than severe, and considerable debility has come on, this symptom is often very troublesome, the saliva frequently running from the mouth.

In the advanced stage of the more severe cases, there is often a viscid frothy secretion from the fauces, while the mouth in general is drier than usual, which forms a very prominent feature of the disease. The patient is constantly hawking up this matter, particularly after eating, and will tell you that all his food turns to phlegm. This discharge is sometimes so great and harassing as to prove the most distressing symptom, and seems not a little to add to the debility. In some cases the tongue, in the more advanced stages, becomes clean, shining, and morbidly smooth, and at length affected with aphthæ. This state of it is seldom

observed except when a considerable degree of fever has supervened, which is not uncommon at these periods.

The skin, in protracted cases, often becomes dry, shrivelled, and sometimes, at length, almost scaly, and the hair is parched and inclined to stand on end, the whole surface is cold, the patient is constantly hanging over the fire, and even experiences frequent fits of chilliness approaching to shivering; he bears all extremes of temperature ill, being as much oppressed by a very high temperature as he is chilled by a low one; wounds heal less readily than usual, and the skin is not unfrequently affected with a troublesome itching, which often shifts its seat, or with nettle rash, herpes, and other species of eruptions, and even ulceration sometimes supervenes without any evident cause.

Besides the more transitory symptoms in the head, which have been mentioned, there are often marks of an habitual undue determination of blood to the brain, producing languid inflammation of the eye lids, tinnitus aurium, and occasionally throbbing of the temples. Some are oppressed with drowsiness, sometimes almost approaching to stupor, others with almost constant pain more or less severe, sometimes in the back of the head, more frequently in the fore part, others are subject to giddiness, and some even to sudden fits of insensibility.

The thoracic viscera are often particularly affected, occasional, and not unfrequently, more or less permanent, dyspnœa supervenes, and the patient is sometimes harassed by a dry and irritating cough, or with fits of palpitation.

When expectoration attends the cough, it is generally difficult, but brings considerable temporary relief. It deserves notice, that in this stage of the disease, he more frequently complains of pain in the left than in the right side; but the seat of the pain is very various, not unfrequently, it is chiefly in the back, about the shoulders, sometimes attended with itching, and in the limbs, more frequently in the legs than the arms. Irregularity of pulse and syncope are not unusual symptoms. The former I have repeatedly known continue for years, even attended with the more characteristic symptoms of angina pectoris without organic affec-

tion of the heart having supervened, although under such circumstances it is always to be dreaded. It is not uncommon for the muscles of the chest to become painful on motion, and even to the touch. The abdominal muscles also are sometimes affected in the same way. This affection is apt to be worse at night, so that the patient turns himself in bed with difficulty and pain.

Of the Symptoms of the Second Stage of Indigestion.

At various periods of the disease, for the most part after repeated derangement of the hepatic function, comes on a permanent tenderness on pressure, sometimes but slight, of the soft parts close to the edge of the cartilages of the false ribs on the right side, after they have turned upwards to be joined to the sternum. This spot is often very circumscribed, and always lies about half way between the end of the sternum and the place at which the lowest of the cartilages begins to ascend; and the cartilage itself near the tender part often becomes very tender, not unfrequently indeed much more so than the soft parts. The patient in general is not aware of this tenderness till it is pointed out by the physician.

This symptom never exists long and to any considerable degree without the pulse becoming hard, and it often at the same time becomes rather more frequent than in health.

There is no other symptom of the disease before us to which I am so anxious to call the reader's attention as to what I have termed a hard pulse, because on it much of the proper treatment seems to depend. It sometimes happens, especially when the tenderness in the epigastrium is considerable, that the pulse becomes such as would on all occasions obtain the name of hard; but more frequently the hardness is only to be distinctly perceived by examining the pulse in a particular way.

Those who have been much in the habit of examining the different states of the pulse must be aware, that its hardness is most perceptible when a slight degree of pressure is employed. A cer-

tain degree, by greatly compressing the vessel, will give some feeling of softness to the hardest pulse, and a slight degree of hardness is not perceptible with the pressure generally employed in feeling the pulse. If the pressure be gradually lessened till it comes to nothing, it often happens that a distinct hardness of pulse is felt before the pulse wholly vanishes under the finger, when no hardness can be distinguished in the usual way of feeling it.

This is in no degree the case in a healthy pulse, nor even in the first stage of the disease we are considering. But when the tenderness of the epigastrium is at all a prominent feature, it may always be perceived, that is, there is then a certain degree of pressure, sometimes very slight, under which the pulse gives a decidedly wiry sensation to the finger, the degree of pressure, under which the hardness may be perceived, denoting its degree. It is most sensible immediately after the patient has been using exercise.

I consider the occurrence of the tenderness of the epigastrium and hard pulse as denoting the second stage of the disease, because from the time of their appearance, at whatever period this happens, we shall find its nature, and consequently the plan of treatment suited to it, changed.

These symptoms are generally accompanied with others, indicating some degree of feverishness. The chilliness of which the patient has long complained is now sometimes, and independently of any change of temperature in the surrounding medium, interrupted by languid and oppressive fits of heat; and the hands and feet, instead of being uniformly cold, as in the earlier stages, often burn, particularly during the first part of the night, while at other times they are more obstinately cold. The thirst also often increases, and sometimes there is a tendency to partial sweats in the morning, especially if the patient lie longer than usual; and these symptoms are generally attended with an increase in some of those of the first stage.

When the tenderness of the epigastrium and hard pulse are considerable, there is generally, more or less an inability of ex-

ercise, except of the passive kind, much active exercise producing an insupportable languor; but slight degrees of the above symptoms are generally unattended by this inability.

The tenderness of the epigastrium, after it has lasted for some time, generally begins to be attended with some degree of fulness in the part, and to extend downwards along the edge of the cartilages, till at length there is a degree of fulness, and sometimes tenderness, throughout the right hypochondrium; which feels firmer than the left; but the tenderness is seldom so great as in the part of the epigastrium above described. Sometimes the pressure, both there and in the hypochondrium, rather produces a sense of oppression affecting the breathing than pain. Sometimes, particularly in the epigastrium, it occasions pain passing through the body towards the back, sometimes quite to the back, at other times a fixed pain or sense of oppression under the sternum, and, in some cases, a pain extending to the left side.

There is often, we have seen, a degree of fulness in the right hypochondrium at earlier periods; but it is then more transitory, being generally relieved, and sometimes removed by the effects of cathartics, and not unfrequently, spontaneously disappearing and returning again.

Such is the regular course of what I have called the first and second stages of Indigestion; but there is a class of symptoms, or rather, a modification of certain symptoms, which, although not forming an essential, constitutes, when it does appear, the most important part of the disease. We have seen that even from the commencement, distant parts of the system, particularly those which sympathize most with the stomach, suffer. When any part has suffered more frequently than the rest, its powers are gradually weakened, and as the second stage proceeds its affections assume in some degree a different and more prominent character. Thus headach, affections of the chest, of the lower bowels, &c., often at length become the chief disease.

It particularly deserves attention that the secondary affections undergo the same change with the disease from which they spring. In the first stage they are merely nervous affections, disappearing

as soon as the cause which produced them ceases to operate. In the second stage they assume an inflammatory character, become more and more of a permanent nature, and in the same proportion, more independent of the original disease, till at length they can not be removed without an appropriate mode of treatment directed to the part secondarily affected. This circumstance renders a particular consideration of them necessary in laying down the means of cure: it will therefore tax the reader's memory less and save repetition to defer any further account of them till we come to this part of the subject. I shall then also, for the same reasons, lay before him such observations relating to the nature of these affections as exclusively apply to them. After this explanation I hope I shall not be accused of a neglect of order in what I shall say on this part of the subject.

In reviewing the symptoms of the disease which forms the subject of this Treatise, it particularly deserves attention that all the diseases which are called, and strictly speaking are, nervous, are apt to run into febrile diseases; injury ensuing if at the period when this change takes place, a corresponding change is not made in the means of cure. Many facts point out, that long continued nervous irritation at length terminates in inflammation of the organ affected. Even an affection, which in the first instance, is wholly sympathetic, arising from irritation applied to a distant part, will, if severe or long continued, terminate in inflammation of the organ sympathetically affected.

In the 43d, 44th and 45th Sections of *Morgagni's* 21*st* Epistle, the reader will find the pleuritis verminosa treated of at some length; he mentions one case in which all the symptoms of pleurisy were well marked that terminated favourably by bloody vomiting which brought up a worm. We might in this instance attribute the relief obtained rather to the loss of blood than the worm; but he refers to a paper of Pedratto on the pleuritis verminosa, where the relief obtained by the expulsion of worms from the stomach and intestines, particularly from the former, is unequivocally proved.

It there appears that all who vomited the worms, or passed

them by the bowels, recovered, while those who did not, died. All the common means of treatment in inflammation of the lungs failed; medicines which destroyed the worms alone were successful. While their expulsion immediately removed the disease, it is impossible for us to believe that real imflammation of the lungs had existed; yet in those in whom the disease had been allowed to take its course, the same appearances were found in the thoracic viscera as in those who die of other forms of pneumonia.

We often see the same principle strikingly illustrated in the diseases of children. We find it obtaining indeed in every instance. When affections of the liver produce pain in the shoulder, there is no disease in this part. The pain is merely sympathetic. If we press or rub the shoulder, the patient feels no more uneasiness from it than he would in the other shoulder; but after the pain has continued for a considerable time the shoulder itself often becomes affected, he can not then bear to have it pressed, and sometimes can not lie upon it.

When inflammation spreads from the intercostal muscles to the lungs, it does not traverse the pleura, reaching the lungs by the fold by which this membrane is reflected over them. It passes at once from the pleura of the ribs to that of the lungs, between which there is no direct communication, for this often happens previously to any adhesion having taken place. Why is inflammation of the bowels as apt to spread to the contiguous parts with which they have no other immediate connexion, as to those which are in continuation with the diseased part? Why does loss of blood by the application of leeches to the skin over an inflamed organ often give more relief than loss of many times as much blood from a distant part? It is needless to multiply instances, whoever observes with attention the phenomena of disease will find them numberless. I have just had occasion to mention a striking one in which the tenderness on pressure of the internal parts of the epigastrium is communicated to the neighbouring cartilage.

These facts teach an important lesson in the prevention of disease, that the first beginnings of many sympathetic affections, however trivial, should be watched with care. The headache fre-

quently occurring from disordered stomach, may at length become a disease of the head, itself; and there is no organ, we have reason to believe, in which disease may not arise in the same way. They teach a lesson of equal importance in the treatment of diseases, the necessity of being minutely acquainted with the history of the case, in order to ascertain, whether sympathy with other parts had contributed to produce disease in those now most prominently affected; for if this has been the case, and the affection of the former still continues, we shall attempt in vain to restore health by means directed only to the latter.

It will appear, I think, from what I am about to say, that it is of the last importance in the treatment of Indigestion, to observe the period at which the above-mentioned change in its nature takes place, at which the disease ceases to be a case of mere nervous irritation, producing a disordered secretion; and begins to affect the sanguiferous, as well as the nervous system; which in many cases happens long before organic disease has taken place, but which, if not counteracted, is generally its precursor.

Indigestion thus comes to be divided into three stages: the first, characterized by the various symptoms above enumerated, arising from the undigested food, from the state of the stomach and bowels, which is the cause of the disease, and from its necessary consequence, the additional irritation to which these cavities are subjected by the undigested food and vitiated secretions; the second, characterized by tenderness, or other uneasiness on pressure in the part of the epigastric region above pointed out, and a degree of hardness in the pulse, often accompanied by other febrile symptoms; and the third, by the symptoms of organic disease in the abdomen, chest, or head.

Of the third stage of Indigestion.

It appears from what has been said, that in the local affections of the second stage of Indigestion, the sanguiferous as well as nervous power of the part affected is involved in the disease. This

state of general derangement of the powers of life can not long continue without change of structure. The symptoms indicative of such derangement, therefore, are the immediate forerunners of organic disease. If they can not be arrested they usher in the last stage of Indigestion. It is a curious fact, and one of the greatest importance in the treatment, that the organic affection rarely takes place in the original seat of the disease, but in other organs with which the stomach sympathizes, the liver, pancreas, spleen, mesenteric glands, lower bowels, heart, lungs, brain, &c.

Thus, when the body is examined after death, the patient is said to have died of disease of some of these parts, and there is nothing in the appearance of the organs to distinguish such affections from diseases which originate in the organs themselves. It is only by a careful attention to the history of the particular case, and to the known laws of the animal economy, that we are enabled to distinguish the sympathetic from the primary disease.

With respect to those cases in which the lungs become diseased, I attempted some years ago, in a paper which the Medico-chirurgical Society did me the honour to publish in the seventh volume of their *Transactions*, to point out the means of distinguishing them from primary diseases of the lungs, and the peculiar treatment which the sympathetic disease requires to prevent its proving as fatal as that whose original seat is in the lungs. In the present publication I am about to enter into the subject more fully, and endeavour, as far as a long continued and anxious attention to the phenomena of the cases in question, and the laws of the animal economy will enable me, to trace the nature and the consequences of that affection of the centre of the system, for so much the stomach may justly be called, which, if neglected, produces a general tendency to disease; that often, if I may so speak, fixes on some vital organ, and wholy destroys its organization.

It is one of the curious circumstances of the progress of the disease we are considering, which particularly demands attention, that when it fixes decidely on one organ, the others are to a certain degree, and some times wholly, relieved. The establishment of the secondary affections generally relieves the dyspeptic symp-

toms; and even a secondary disease may be relieved by another supervening on it.

Thus, it is not uncommon in Indigestion for the liver to suffer in such a manner, that it shall become enlarged and tender on pressure: and when the disease is distroying the texture of the lungs, having spread from the liver to them, for the former to recover, or nearly recover, its healthy state. Sympathetic disease, when completely established, seems to act on that which excites it, in the same way, though much more effectually, in which artificial drains are found to do, while the sympathetic affection which precedes the establishment of actual disease, tends to increase the original derangement. Thus an extensive external disease, as I have witnessed, occurring in such cases, will often save the vital organ, even after the disease has made considerable progress in it.

Why the spontaneous occurrence of external disease in these cases produces an effect which we can so feebly imitate by exciting such a disease, we can no more explain than why a spontaneous sweat carries off fever, while one produced by art, and even by means which themselves relieve fever, often brings little or but partial relief; or, why a spontaneous fit of shivering is often followed by a hot fit and perspiration which puts a period to the fever, while a shivering produced by art, would hardly ever fail to increase it.

To enter fully on what I have called the third stage of Indigestion, that in which it has produced organic affections, would be foreign to my purpose, and would lead to a consideration of a large proportion of all the most serious diseases to which we are subject; for organic affections not only vary according to their degrees, and the organ they affect, but according to the consequences resulting from them, abscess, atrophy, dropsy, &c.

I shall in the last chapter, treat of this stage of the disease at such length as the nature of the present treatise admits of. On account of the extensive nature and great variety of Indigestion, according to the sense in which I use this term, it will be the most distinct plan to lay before the reader the causes and treatment of the first and second stages, the symptoms of which have

been detailed, before I enter on a more particular consideration of the last stage.

Of the various forms and comparative duration of the different stages of Indigestion.

The relative duration of the different stages, as well as the severity and nature of their symptoms, is very various in different cases. In some the first stage is very slowly, even when the occasional causes of the disease have been long and repeatedly applied, changed into the second. Thus we see men of the most irregular habits, and others whose habits are good, but whose digestive organs are naturally weak, for many years labouring under the symptoms of the first stage of Indigestion, without the disease, if I may be allowed the expression, fixing on them. The former are greatly indebted to a natural vigour of constitution, and in the latter, the stomach alone is weak. In the former, particularly when the above symptoms have been severe, when at length any considerable degree of inflammatory action supervenes, change of structure often very quickly ensues; the organs, from long continued irritation, being, as it were, prepared for the change.

In others, on the contrary, particularly those of a more feeble constitution, the second stage soon shows itself. Before the symptoms of the first stage have long attracted notice, tenderness in the epigastrium supervenes, and the pulse becomes contracted. In such cases the second is generally the protracted stage of the disease, and the patient often continues to be much harassed, and occasionally seriously ill, for a long time before organic disease is established.

After this has taken place, the duration of the disease, in different cases, is also very various, the change proceeding more or less rapidly according to the strength of the constitution, and other causes, some of which seem involved in great obscurity. But it may in general be observed, that the longer and to the greater degree the causes have been applied previous to the occurrence of organic disease, the more rapid is its progress.

The proportional prevalence of the different symptoms of Indigestion is as various as the duration of its stages.

In the first stage, pains and other affections of the head in some, in others. fits of palpitation, cough, and dyspnœa, or distention and pains of the stomach, or flatulence and irregularity of the bowels are the most troublesome symptoms. The symptoms of the second stage in like manner, which are both more varied and more strongly marked than those of the first stage, in some, are chiefly confined to the abdomen; in others affect the other cavities, and the different symptoms are variously modified in different cases.

Thus Indigestion presents itself in various forms, which in its progress assume more decided characters; and no cases can differ more from each other than those which form the last stage of this disease; which necessarily varies according to the organ in which the change of structure takes place; and it tends still further to perplex the symptoms, that in some cases the disease proceeds in more than one organ at the same time, the affection of the one not arresting that of the other, as we have seen often happens.

In every stage of the disease, indeed, there is endless variety, and the more nearly it approaches to its fatal termination, the more its different cases assume the appearance of diseases which have nothing in common.

With regard to the circumstances, which dispose the sympathetic disease to affect one part in preference to another, we have reason to believe that this is chiefly determined by different parts in different individuals being more liable to disease than others, and therefore feeling more the cause of irritation which affects the whole system. Thus in children, who are disposed to inflammation and subsequent effusion in the ventricles of the brain. Indigestion often terminates in hydrencephalus internus. From about fifteen to thirty-five years of age, the disposition to affections of the lungs is greatest, and it often produces phthisis. At a more advanced period, a tendency to disease of the rectum prevails, and in old age to affections of the heart and head, the latter however of a different nature from those to which children are sub-

ject; and we still observe the tendency of Indigestion to produce the disease to which the system is disposed, whatever be its seat.

These observations seem particularly applicable to the inflammation and consequent organic affection of the feet in gout. When a tendency to this disease exists, it may be induced by any cause that produces, and for a certain time keeps up, Indigestion. In some the disposition to gout is so great, that it appears without being preceded by symptoms of derangement in the first passages; but in the majority of cases it is preceded by these symptoms, and the tendency to them seems to constitute a considerable part of the hereditary disposition to gout.

The regular forms of this disease not affecting a vital part, tend less to derange the system in general and give more relief to the primary disease than most of the other symptomatic affections which have been enumerated, the patient often remaining well for some time after; and the more cautious he is in preserving the vigour of the digestive organs, the longer interval he enjoys. Hence appears the danger which attends interrupting the regular fits of gout, the sympathetic disease being prevented from taking the course which the disposition to affection of the extremities gives it, seizes on the part, generally an internal one, which next to these is most liable to disease; and on the other hand, if any thing so affects any of the vital parts during a fit of gout as to render it considerably the weakest part, the sympathetic disease sometimes leaves the joints and seizes on the internal part, producing what is called retrocedent gout. It is evident that the risk of both these accidents will be greatest, where the powers of the system are most impaired.

The connexion of Indigestion and urinary gravel particularly deserves attention, as it differs from the connexion of the former with the preceding diseases. It is not by sympathy alone that the Indigestion appears to excite it. I have already had occasion to make some observations on the states of the urine in Indigestion. In most cases of this disease, we have seen, there is a considerable production of acid in the first passages. This acid, as appears from the experiments above referred to, enters the mass of

blood, and is thrown out of the system by the skin and kidneys. As all other acids occasion a precipitation of lithic acid from the urine, when the action of the skin is impaired, the acid we are speaking of often passes in such quantity by the kidneys as to cause a deposition of lithic acid, before the urine leaves these organs, which there, probably in consequence of being agglutinated by a secretion from the internal surface of the kidney, excited by the irritation of the fine sand, frequently concretes into small masses occasioning fits of gravel.

We have seen that a precipitation of lithic acid, after the urine has stood for some time, is a frequent symptom of Indigestion. The gravel which often attends this disease is only a greater degree of this symptom, for it appears from the observations of the best writers on calculous diseases, that the calculi formed in the kidney are almost always concretions of lithic acid * Thus it seems to be, that in old age, gout and gravel often alternate, as it is in the intervals of the gout that Indigestion chiefly prevails, the affection of the joints relieving the stomach during its continuance. The duration of this relief, after the fit, becomes less in proportion as the constitution has been enfeebled by repeated attacks.

* See the paper above referred to in the last volume of the *Transactions of the College of Physicians.*

CHAPTER II.

OF THE CAUSES OF INDIGESTION.

The causes of a disease are divided into immediate and remote, the changes in the body which more or less directly excite the symptoms, and the causes which produce these changes.

As it is impossible to understand the operation of the remote causes of Indigestion, without a knowledge of the digestive process, our attention must, in the first instance, be directed to this subject.

SECTION I.

Of the Process of Digestion.

It has been ascertained by the experiments of Spallanzani and others, that the stomach secretes a fluid capable, even out of the body, of converting the food into such a mass as that into which it is changed in the stomach, immediately before it is sent into the duodenum. This fact leaves no room to doubt, that it is by the agency of the above fluid that the food undergoes the change which is effected on it in the stomach; and it appears from the observations of Mr. Hunter, that such is the power of this fluid, that it often corrodes the stomach itself when deprived of the vital principle by which it is enabled to resist its action. When to these facts we add, that by means of the muscular power of the stomach, the food, when duly prepared by the action of the gastric

fluid, is propelled into the duodenum, we state the sum of our knowledge on this subject. These facts, however, are far from affording an explanation of the process which takes place in the stomach. It does not appear from the observations of any of the authors here referred to, by what means the fluid which is secreted by it is uniformly applied to the food, nor upon what principle the food which is prepared for the duodenum is separated from the rest.

Mr. Hunter found that even when part of the stomach itself had been dissolved by the gastric fluid, the food last taken remained wholly unchanged. This fact alone is sufficient to militate against the idea assumed by some, that by the muscular power of the stomach its contents are so moved as to be continually in the act of being mixed together and with the gastric fluid, by which their uniform solution is effected. According to this view of the subject also, it would be difficult to account for the gradual discharge of the contents of the stomach into the duodenum. This intestine must either for a long time cease to receive any food from the stomach after every addition made to the contents of the latter, or receive food in every different stage of solution, an imperfection in a natural process which is in opposition to every thing we know of the animal economy.

My attention was particularly directed to this subject by finding from many trials, that when the eighth pair of nerves is divided in the neck of a rabit, and one portion of each nerve folded back,* immediately after the animal has taken a full meal, after a fast of whatever continuance; none but undigested food is found in its stomach, provided it has been allowed to live for a certain number of hours after the operation. Now, if, without the division of these nerves, the rabbit be killed after a fast of however

* It has been found by repeated experiments, that if neither of the divided ends be displaced, some nervous influence still passes by the divided nerve, and that, although the divided ends be separated by a space of even a quarter of an inch. See the *Journal of the Royal Institution*, No. 23, page 17, et seq. It was this circumstance which gave to Mr. Brodie and Mr. Broughton results different from those which Dr. Hastings and myself had obtained.

many hours, some food is always found in its stomach, reduced apparently to the same state as that which, during the ordinary period of digestion, is sent to the piloric portion, except that from the continued secretion of the fluids of the stomach it is mixed with a greater proportion of them. It would seem indeed that the stomach of this animal is not able so to contract as to expel the last part of its contents.

When the foregoing experiment is considered it will appear either that the food, last received into the stomach, is never mixed with that already there, and which has more or less undergone the action of the gastric fluid. or if they be mixed together, that the stomach has the power of again separating them, retaining the one and propelling the other into the intestine. These facts induced me to make some experiments on a large scale, for the purpose of ascertaining with great accuracy the process which takes place in the stomach, without which it is impossible to understand the nature of the symptoms which arise from its defects.

With this view I examined the stomachs of about a hundred and thirty rabbits immediately after they had been killed in the usual way, which is by a blow on the back part of the bead, at various periods of digestion. The following were the results.*

The first thing that strikes the eye on examining the stomachs of rabbits which have lately eaten is, that the new is never mixed with the old food. The former is always found in the centre, surrounded on all sides by the old food, except that on the upper part between the new food and the smaller curvature of the stomach there is some times little or no old food. If, as we ascertained by more than twenty trials, the old and the new food be of different kinds, and the animal killed before a great length of time has elapsed after taking the latter, the line of separation is perfectly evident, so that all the old may be removed without disturbing the new food. To ascertain this point we fed rabbits on oats,

* *Inquiry into the Laws of the Vital Functions.* It is hoped that the reader will excuse the frequent references to this Treatise in this and the last Sections of this Chapter, because it is by facts, which appear to be ascertained in it, that I shall attempt some parts of the pathology of Indigestion.

and after making them fast for sixteen or seventeen hours, allowed them to eat as much cabbage as they chose, and killed them at different periods, from one to eight hours, after they had eaten it.

On opening the stomachs of rabbits three or four weeks old, who both sucked and ate green food, we always found the curdled milk unmixed with the green food. Before the stomach was opened we could, from its transparency, see where the green food and where the milk lay.

If the old and new food be of the same kind, and the animal be allowed to live for a considerable time after taking the latter, the gastric fluid passing from the old to the new food and changing, as it pervades it, renders the line of separation indistinct. So that on a cursory view we should suppose the old and new food mixed together, but towards the small curvature of the stomach and still more towards the centre of the new food, we find it, unless it has been very long in the stomach, undisturbed and comparatively fresh. All around, the nearer the food lies to the surface of the stomach the more it is digested. This is true even with regard to the food in the small curvature, compared with that nearer the centre, and the food which touches the surface of the stomach is more digested than any other found in the same part of the stomach; but, unless the animal has not eaten for a great length of time, the food in contact with the surface of the stomach is in very different stages of digestion in different parts of this organ. It is least digested in the small curvature, more in the large end, and still more in the middle of the great curvature.

The foregoing observations apply to the cardiac portion of the stomach, the food in the pyloric portion, is always found in a state very different from that just described. It is more equally digested, the central parts differing less from those which lie near the surface of the stomach. It is evident, however, that all the change effected in the stomach is not completed when the food enters this portion of it, because we find it the more digested the nearer it approaches to the pylorus, where, being ready to pass into the intestine, it has undergone all that part of digestion which is performed in the stomach.

It appears, that in proportion as the food is digested it is moved along the great curvature, where the change in it is rendered more perfect to the pyloric portion. Thus the layer of food lying next the surface of the stomach is first digested, and in proportion as this undergoes the proper change, and is moved on by the muscular action of the stomach, that next in turn succeeds to undergo the same change.

As the gastric fluid, to a certain extent, pervades the contents of the stomach, though apparently in no other way than by simple juxtaposition, for the arrangement of the food, above described, we never found disturbed; the change in each part, which in its turn comes in contact with the stomach, is far advanced before it is in actual contact with it; and consequently is soon after this in a proper state to be moved on toward the pyloric end.

Thus a continual motion is going on, that part of the food which lies next the surface of the stomach passing towards the pylorus, and the more central parts approaching the surface; whether food is ever so digested in the small curvature as to be sent to the pyloric portion without having traversed the large curvature, I have not been able to ascertain. When rabbits have fasted sixteen or eighteen hours, the whole food found in the cardiac portion, which is in small quantity compared to what is found in it after a fast of short duration, seems to be all nearly in the same state with that next the surface of the large curvature, the gastric fluid having pervaded and acted upon the whole, and is consequently, as far as we can judge, prepared to be sent to the pyloric end.

It is in the great end of the stomach, where the digestion appears to go on so rapidly, that Mr. Hunter found the stomach itself dissolved, and by the most satisfactory arguments showed, that this is the effect of the gastric fluid after death. His observations on this subject confirm the foregoing view of digestion, and show that the same process, observed in the stomach of the rabbit, takes place in the human stomach; for he found part of the stomach dissolved, while the recent food it contained remained

wholly undigested, in the case of a man who happened to be killed immediately after a full meal.

This I have often observed in rabbits when they have been killed immediately after eating, and allowed to lie undisturbed for some time. On opening the abdomen, we have found the great end of the stomach soft, eaten through, sometimes altogether consumed, the food being only covered by the peritoneum, or lying quite bare for the space of an inch and a half in diameter, and part of the contiguous intestines in the last case also consumed, while the cabbage, which the animal had just taken, lay in the centre of the stomach unchanged, if we except the alteration which had taken place in the external parts of the mass it had formed, in consequence of imbibing gastric fluid from the half-digested food in contact with it.

We sometimes found the great end of the stomach dissolved within an hour and a half after death. It was more frequently found so when the animal had lain dead for many hours. This effect does not always ensue, however long it has lain dead. It seems only to take place when there happens to be a greater than usual supply of gastric fluid, for we always observed it most apt to happen when the animal had eaten voraciously.

Why it should take place without the food being digested is evident from what has been said. Soon after death, the motions of the stomach, which are constantly carrying on towards the pylorus the most digested food, cease. Thus the food which lies next to the surface of the stomach, becoming fully saturated with gastric fluid, neutralizes no more, and no new food being presented to it, it necessarily acts on the stomach itself, now deprived of life, and on this account, as Mr. Hunter justly observes, equally subject to its action with other dead animal matter. It is remarkable that the gastric fluid of the rabbit, which lives wholly on vegetable food, should so completely digest its own stomach as not to leave a trace of the parts acted on.* I never saw the stomach eaten through except in the large end, in other parts its internal membrane is sometimes injured.

* The rabbit will often, when hungry, eat animal food very readily.

Although the food is in the most digested state in the pyloric end, it appears both from the fact just mentioned, and several other circumstances, that the change is chiefly effected in the great end of the stomach. The food found in the pyloric end is comparatively dry, while that found in the great end, if digestion is much advanced, is mixed copiously with the fluids of the stomach, and there is a more evident difference in the state of the food, before it comes into this part, and when it is about to leave it, than in any other part of the stomach. Dr. Hastings, on examining the stomach of a woman, who had died under his care, found it every where in a state of ulceration, except in the great end, where it was healthy. The stomach had performed its functions to the last, and the state of the alvine discharge proved, that the food had been properly digested.

If we keep in view the foregoing account of the process of digestion in the rabbit, it will be interesting to trace the effect produced on it by depriving the stomach of a great part of its nervous influence, by dividing the eighth pair of nerves in the neck.

The division of this pair of nerves is one of the oldest physiological experiments of which we have any account. It was performed by several of the ancients, and has been repeated by a great many physiologists in modern times. Valsalva is among the first who gave any distinct account of its effect on the stomach. Haller, and many others, repeated it and describe its effects on this organ.*

If the animal be allowed to live for a considerable time after these nerves are divided in the neck and one portion of each folded back, the food remaining in the stomach we have seen, if the animal has lately taken a full meal, is always found undigested, and nearly in the same state in all parts of the stomach, a circumstance which I was at first greatly at a loss to explain. This effect is uniform, I never saw it otherwise. Yet we must conceive, that at the time the animal last eats, there is some food more or

* See a paper by Dr. Hastings, in the 21st number of the *Journal of the Royal Institution*, on the effects of dividing the eighth pair of nerves.

less digested in its stomach, and some gastric fluid to act on part of that just received into it. The foregoing statements explain the difficulty. The division of the eighth pair of nerves prevents the due formation of the gastric fluid; but the animal still living, and the motions of the alimentary canal being independent of the nervous influence,* the usual motions of the stomach continue and send onwards into the duodenum, all the food which is digested, and consequently capable of applying to the stomach that stimulus, which excites its natural motions.

Thus it is evident, that the undigested food must at length come into contact with it. As soon as this happens the usual secretions not being supplied to produce the proper change in the food, an unnatural motion is excited; hence the efforts to vomit, which generally ensue in about an hour, an hour and a half, or two hours, after the division of the nerves, marking the time when the stomach having sent towards the pylorus its digested contents, begins to feel the effects of undigested food coming into contact with it. To these efforts to vomit we must ascribe the circumstance of food being generally found in the œsophagus when an animal dies from the division of the eighth pair of nerves, for food is found there although it is not allowed to eat after the operation. If the animal be allowed to eat after the operation, the efforts to vomit almost immediately ensue, the food, as is evident from the way in which it enters the stomach, directly coming in contact with some part of the small curvature.

Thus we see the cause of the efforts to vomit which follow the division of the eighth pair of nerves; and why, if the animal be allowed to live for a certain time after the operation, nothing but undigested food is found in the stomach. It also appears from the same circumstances, why the stomach is generally more distended than usual after the eighth pair of nerves have been divided, particularly if the animal had been allowed to eat after the operation, all the food not digested by the gastric fluid present

* Experimental Inquiry, Chap. 6.

before the division of the nerves, remaining in the stomach, and swelling from the heat and moisture.*

From all that has been said it appears, that the process which the food undergoes in the stomach is that of being formed into a mass, in appearance nearly homogeneous; that this process takes place only on or near the surface of the stomach, and that, in proportion as the food there situated undergoes the necessary change, it is by the muscular power of the stomach moved onwards towards the pylorus, making room for that which next succeeds, till the whole contents of the stomach have undergone this process, the digested contents being regularly discharged into the duodenum, as they arrive at the pylorus, till most, and in some animals, all the contents of the stomach are thus removed into that intestine; from which, after they have for some time been detained there, and mixed with the bile and pancreatic fluid, they are continually passing into the adjoining parts of the canal.

When the gastric fluid has not a constant supply of fresh food to neutralize it, it is capable, as appears from what has been said, of corroding the stomach itself, after the vital principle of this organ is extinct; from which it appears probable, that the uncombined gastric fluid may produce some effect on the coats of the stomach during life, and various facts would lead us to suppose that the sensation of hunger arises from the action of this fluid. A supposition which seems to be confirmed by the following experiment.

A person in good health was prevailed upon to abstain from eating for more than twenty hours, and further to increase the appetite by more exercise than usual. At the end of this time he was very hungry, but instead of eating, excited vomiting by drinking warm water, and irritating the fauces. The water returned mixed only with a ropy fluid such as the gastric fluid is described to be by Spallanzani, or as I have myself obtained from the stomach of a crow. After this operation not only all desire to eat was removed, but a degree of disgust was excited by seeing others eat. He, however, was prevailed upon to take a little milk and

* I have sometimes, but very rarely, seen a small quantity of undigested food in the duodenum.

bread, which, in a very short time, ran into the acetous fermentation, indicated by flatulence and acid eructations.

It seems an inference from this experiment, that the pains caused by hunger may be prevented by constantly exciting vomiting; and the death, which arises from it, converted into that from inanition, which only proves fatal after the lapse of some weeks. People live for weeks without food in fevers, where there is no secretion of gastric fluid.

It would appear then that one of the uses of the gastric fluid is, by the action on the coats of the stomach, to remind us when a supply of food is necessary.

We have reason to believe from the result of the foregoing experiment, as well as from other circumstances, that in man the stomach is capable of propelling the whole of its contents into the duodenum. In a case of Indigestion, I saw orange juice which had remained on the stomach for twenty-four hours, brought up by vomiting, unmixed with any thing, and apparently little, if at all, changed. In this case there was no appetite, and no secretion of gastric fluid.

Having traced the different steps of the process of digestion in the healthy stomach, we are better prepared to understand the operation of the causes which disturb it.

SECTION II.

Of the remote causes of Indigestion.

In considering the remote causes of this disease, the attention, we shall find, must be as much directed to the sympathy of the alimentary canal with other parts of the system, as in enumerating its symptoms; for as the whole system is essentially influenced by the affections of that canal, and some parts peculiarly so; in like manner it is influenced by affections of the system in general, and particularly of those parts. The remote causes of Indigestion, therefore, may be divided into those which act directly on

the stomach and intestines, those which act on other parts, and those which affect the whole system.

It may be proper here to call the reader's attention to a circumstance which greatly influences the phenomena of diseases, and, in particular, tends to render them protracted and difficult of cure. The affections, whether primary or secondary, of parts which sympathize, influence the state of each other. Thus sympathetic affections, provided they have not been converted into actual disease of the part, in which case, we have seen, they relieve the original disease, become causes which support and aggravate it. The debility of the skin, for an example, occasioned by Indigestion, so reacts on the digestive organs, as to increase the disease of the stomach. Similar observations apply to the sympathetic affections of the liver, the brain, &c., produced by the diseased state of the stomach; and the disease is farther aggravated by the increase of general debility caused by these affections. It is thus that the evil increasing, if I may be allowed the expression, in a geometrical ratio, and not by simple addition, the whole powers of the system, in severe attacks of disease, often sink with a rapidity which at first view appears unaccountable. We shall find these facts strikingly illustrated in considering the causes and treatment of Indigestion.

It is evident from what has been said of the function of the stomach, that it may be deranged in two ways; either by causes affecting its secreting power, so that the proper chemical change is no longer effected in the food; or by such as debilitate its muscular power, so that the food, though properly prepared, as far as it is brought into contact with proper parts of the stomach, is neither duly so brought, nor regularly propelled into the duodenum.

It appears from the experiments related in the *Inquiry into the Laws of the Vital Functions* above referred to, that the muscular fibre, though independent of the nervous system, may be influenced through it. It follows, therefore, that the muscular fibres of the stomach may not only be affected by causes acting directly on them, but by such as act through the medium of their nerves.

Among the chief causes of Indigestion, which act directly on

the muscular fibres of the stomach, are narcotic and other offensive substances received into it. I have found, that although opium applied to the external surface of the alimentary canal and heart, produces no sensible effect on their muscular power, applied to their internal surface it produces the same effect as when directly applied to the muscular fibres themselves;* impairing their power, unless the quantity be extremely minute, and instantly destroying it if the quantity be considerable.

It may be questioned whether the opium pervades the fine internal membranes of these organs and acts directly on their muscular fibres, or affects these fibres through the nervous extremities distributed on this membrane. This is a question of little importance. I consider it as acting immediately on the muscular fibres, because its effect is the same as when directly applied to them, and different from what it is when it acts evidently on the nerves themselves; and we know that the bile is capable of transuding through the coats both of the gall bladder and intestines.

It is probable that other offensive substances received into the stomach, tobacco, distilled spirits, strong peppers, those of an acid or putrid nature generated in the stomach itself, &c., may also in the same way immediately affect the muscular fibres. All these substances, however, as will presently appear, otherwise influence the state of the stomach. We have reason to believe that the reception of large quantities of very warm or very cold fluids also directly affect these fibres. It is not uncommon for a fit of Indigestion to be induced by taking suddenly considerable quantities of iced fluids. Violent and repeated vomiting also debilitates the muscular fibres of the stomach. But of the causes which immediately affect them, the most frequent and powerful is morbid distention. We know that the muscular power of the stomach, rectum, and bladder, and we have reason to believe that the same observation applies to the heart and other similar

* *Inquiry into the Laws of the Vital Functions.* Page 133, *et seq.* Second edition.

cavities, may for the time be wholly destroyed by over distention. The stomach may be so distended that the most powerful emetics will not excite vomiting,* notwithstanding the muscles sympathetically excited in this operation, those of the abdomen and diaphragm, are thrown into strong and repeated action; one among many proofs, that however necessary the action of these muscles in vomiting, it is by that of the stomach itself that its contents are rejected. The abdominal muscles excite the action of the stomach in this operation, in the same way that the same action of these muscles, though sudden and powerful, excites the bladder and rectum. So perfectly the same indeed are these actions, that if the bladder and rectum are sufficiently distended at the time of vomiting to be effectually excited, their contents also are discharged, unless retained by a voluntary act exciting their sphincters. In all these instances the action of the hollow muscle is excited by being pressed against its contents by the abdominal muscles and diaphragm.

The most common cause of morbid distention of the stomach is eating too fast; for the appetite only subsiding in proportion as the food combines with and neutralizes the gastric fluid, previously in the stomach, when we eat too fast, time is not given for it to combine with that part of the food which is presented to it, till so much is taken that the whole gastric fluid, which the stomach is capable of supplying during the digestive process, is not sufficient to effect the due alteration on the food; whereas when we eat slowly, so that a proper time is given for the above combination to take place, the appetite abates before the stomach is overcharged: for while digestion goes on, and the gastric fluid is only supplied in proportion as fresh food comes in contact with the coats of the stomach, it combines with the food as it is formed and never excites the appetite.

Every one has occasionally observed that if his meal is inter-

* The reader will find some good observations on this subject, and cases illustrative of them, under the head of *Gastritis, in Eller's Work De cog et Cur. Morbis.* I also beg leave to refer him to my treatise on *Symptomatic Fevers*, page 131. Fourth edition.

rupted for ten or fifteen minutes after he has eaten perhaps not more than a third of the usual quantity, he finds that he is satisfied. The gastric fluid which had accumulated has had time to combine with, and be neutralized by, the food he had taken. It is for the same reason that a few mouthfuls taken a little before dinner will often wholly destroy the appetite, especially in delicate people, in whom the gastric fluid is secreted in small quantity, or of a less active quality. Frequent interruptions in eating would be injurious, because we should thus be prevented taking the proper quantity of food, for digestion seems chiefly performed by the fluid which is secreted, as fresh food comes in contact with the stomach; and the time, which that which has accumulated requires for its neutralization, which of course must be more or less according to the accumulation which has taken place, that is, generally speaking, according to the length of our fast, is the proper measure of the quantity which ought to be taken, provided we continue to eat, without devouring, our food.

Another frequent cause of over-distention of the stomach is high seasoning and great variety of food, or such as particularly pleases the palate, by which we are induced to eat after the appetite is satisfied; or by the stimulus of the high seasoning a greater supply of gastric fluid than the food calls for is excited, and thus the appetite prolonged. This seems in particular to be an effect of wine drank during dinner. This practice, although it occasions less immediate inconvenience than eating too fast, often, if carried very far, by the preternatural excitement of the stomach, at length impairs its vigour. It is not uncommon in those who have greatly indulged in the pleasures of the table, to find the stomach enlarged, and its fibres sensibly relaxed.

The degree of distention which the stomach undergoes also depends much on the kind of aliment. All food appears to swell more or less after it is received into the stomach; some kinds more than others, and of course that which is most difficult of digestion *cet. par.* swells most; both because it is digested and removed from the stomach most slowly,* and because that which most

* See what was said in the last Section of the Nature of the Digestive Process.

resists the action of the gastric fluid is most apt to run into fermentation. In considering the treatment, I shall have occasion particularly to point out the diet most easy of digestion.

It is not by its effects on the muscular fibres of the stomach alone, however, whether acting directly on those fibres, or through the intervention of their nerves, that over-distention tends to produce Indigestion. Its operation on the nerves of the stomach themselves is equally injurious. It is by this effect that it produces that peculiar pain, restlessness, and sense of oppression, which attend an over-distended stomach. Such irritation of the nerves of a secreting surface can not exist without affecting its secreting power.* The gastric fluid becomes less fitted for its functions, and thus the distention is increased, and other evils induced. The contents of the stomach not being duly changed, acquire morbid properties, and the various symptoms detailed in the first chapter supervene.

When morbid distention of the stomach and its consequences frequently recur, the powers of this organ are weakened, and the debility sooner or later, extends to the other organs concerned in the digestive process.

But morbid distention is only one among many causes which may derange the nervous power of the stomach, and thus vitiate its secretion. It is probably in this way, in part, that many of the causes which have been mentioned operate. Others appear to make their impression wholly on the nervous system, only secondarily affecting the muscular fibres of the stomach; violent passions, particularly grief and anxiety; too long application to business, severe study, and excessive venery. Strong impressions of the mind often instantly destroy the appetite by occasioning such a secretion of gastric fluid, as, not possessing healthy properties, at once itself fails to apply the due stimulus to the stomach,

* It appears from experiments detailed in *An Inquiry into the Laws of the Vital Functions*, to which I have frequently had occasion to refer, and in *The Journal of the Royal Institution*, that the nervous influence is immediately essential to the changes which constitute secretion. I beg leave to refer the reader to papers on this subject, which the Editor of the above Journal did me the honour to publish in the eighteenth, twenty-first, and twenty-third numbers of that work.

and tends to vitiate the effect of that which had been previously secreted.

Indigestion sometimes arises from mechanical pressure, either of the stomach itself, or other parts of the alimentary canal from tumours or indurations of neighbouring parts, or from extraneous bodies lodged in any part of the canal. These causes are comparatively rare, and consequently not to be inferred, except from circumstances which unequivocally point out their existence.

Other causes have a more complicated operation, not only directly affecting the powers of the stomach, but influencing it at the same time by their operation on other organs, with which it particularly sympathizes. In intoxication, the stomach not only suffers from the morbid stimulus of the intoxicating fluid, but in consequence of its effects on the brain. Similar observations apply to a moist, cold, and variable atmosphere. The stomach not only suffers by the general debility and relaxation induced on the nervous, and, through it, on the muscular system; but also by the peculiar effects of such an atmosphere on the office of the skin. Thus, too free a use of calomel and other medicines which powerfully affect the abdominal secretions, not only injures the stomach by their direct effect on this organ, but by the disorder excited in parts with which it immediately sympathizes.

Some causes of Indigestion affect the stomach chiefly by sympathy. The principal of these are various affections of the bowels, the most common long-continued constipation. We find instances of the same kind in the Indigestion produced by diseases, and even accidents affecting the head; by stone in the bladder, &c.

So extensive, indeed, are the sympathies of the stomach, that whatever greatly disorders the function of any important organ may be ranked among the causes of Indigestion; its tendency to produce this disease being proportioned to its degree, and the degree of sympathy which exists between the stomach and the part primarily affected.

It seems chiefly by their effects on the system in general, that indolence, and debility arising from long disease and other causes, not unfrequently prove the exciting cause of Indigestion.

All the exciting causes of this disease, applied in a less degree, act as pre-disposing causes.

Among its pre-disposing causes must be ranked variable weather. The influence of the spring, indeed, seems often to act as the exciting cause in the pre-disposed, and, from its tendency to induce the inflammatory diathesis, particularly disposes to the symptoms of the second stage, in those who have for some time laboured under the disease. The latter may also be said of taking cold, and all other causes of inflammation.

The period of life from puberty to about thirty, and old age, and in some an hereditary disposition, also pre-dispose to indigestion. It is common to find the descendants of those who have suffered much from Indigestion labouring under this disease. Much has been said of the nature of hereditary disease; all that is necessary for us to know, is the fact, which can not be disputed, that those parts which were most liable to disease in the parent, are likewise found so in the children; but neither is this universally the case, nor does the disease necessarily take place when the disposition to it exists.

SECTION III.

Of the immediate causes of Indigestion.

The immediate causes of a disease are the states of body induced by the remote causes, and from which all the symptoms more or less directly arise. A knowledge of these causes is of the greatest importance in conducting the treatment of the disease. Where we are altogether ignorant of them, the treatment is founded either on the simple principle of employing the same means which have formerly proved useful, or on our general knowledge of the laws of the animal economy. It is only in proportion as we are acquainted with the immediate causes of a disease, that our endeavours can be directed to restore the due functions of the parts affected; and in the instances, in which, after having long treated diseases on the vague principles, which are our only guides

when the immediate causes are wholly unknown, we have at length arrived at a knowledge of these causes, we perceive that many parts of our former plans were superfluous, and not a few, although affording some present relief, injurious.

In angina pectoris, for example, before it is known to depend on an obstructed circulation through the heart, the stomach was oppressed with a constant succession of anti-spasmodic medicines, because the symptoms are similar to those, which we know, from the general laws of the animal economy, spasm of certain parts necessarily produces; and the disease was increased by warm stimulating medicines which the debility, necessarily attendant on the state of the circulation, seemed to call for.

As soon as dissection unfolded the nature of this disease, it was evident that anti-spasmodics, however they might relieve certain symptoms, and consequently be proper for immediate relief, could do little towards preventing the recurrence of the attack; and that all powerful stimulants, by increasing the flow of blood to the heart, already incapable of duly transmitting the usual quantity, serve only to hasten the fatal termination.

In endeavouring to trace the immediate causes of a disease, there are two objects which demand attention, the change produced in the seat of the disease by its remote causes, and the manner in which this change produces the symptoms. Without a knowledge of the first of these, our principles of treatment must be vague; without that of the other, they can not be adapted to the particular cases under treatment. To recur to the disease just mentioned; till we knew that angina pectoris from the difficulty with which the blood is transmitted through the heart our only principle of treatment was to relieve the most urgent symptoms; and now that we are acquainted with this cause, if we could not distinguish what symptoms immediately depend upon it, and what are secondary, arising from sympathy and peculiarity of constitution, our plans of treatment, it is evident, could not be suited to individual cases.

The first part of the subject has already been considered. It is evident, from what has been said in the first and second sec-

tions of this chapter, on the one hand, that the causes of Indigestion must necessarily affect either the muscular or nervous power of the stomach, or both, on which we have seen its function depends; and, on the other, that all the causes above enumerated are evidently such as influence them. In considering the remaining part of the subject, the manner in which debility of the muscular and nervous powers of the stomach produce the symptoms of Indigestion, I shall in the first place, consider those of the first, and afterwards those of the second stage of this disease.

Little need be added to what I have already had occasion to say of the symptoms which are confined to the stomach itself. As the food can only be regularly propelled into the duodenum by the due action of muscular fibres of the stomach, it is evident that, if this fails, oppression and distention must ensue; and if the due secretion of the gastric fluid depend on the healthy state of the nervous influence of the stomach, its properties must be affected by any cause disordering this influence, and it will consequently fail to produce the due change on the food.

As it appeared from what was said above, that the causes affecting the muscular power of the stomach by the derangement which every morbid affection of this power occasions in the digestive process, soon affects the nerves of that organ; it may now be observed, that all causes affecting the nervous power of the stomach, independently of the direct action of the nervous on the muscular power, by preventing the food from being formed into that substance which is the natural stimulus to the muscular fibres of the stomach, enfeebles their action; which we have seen is wholly prevented, if the cause affecting the nerves be so powerful as entirely to prevent the due change on the food, as happens when the eighth pair of nerves is divided, and one portion of each folded back. The morbid distention and undigested food thus constantly applied to the surface of the stomach, still increase the debility of both nervous and muscular powers. So complicated is the operation even of those causes of disease, which at first view appear the most simple.

The manner in which a morbid affection of the muscular or

nervous power of the stomach produces the symptoms of Indigestion affecting distant parts, is by no means so evident. The first question which arises is, Why does the influence of affections of the stomach, and other vital organs, extend through all parts of the system, while the powers of the organs of sense, parts of equal sensibility, may not only be deranged, but wholly destroyed, without affecting the function of any other part? It may be said, because the latter are not organs essential to life. This reply, it is evident, relates to the final, not the efficient, cause; and only suggests other terms in which the question may be put. I need hardly observe, that I here speak of the function of the organs of sense, not of the powers which sustain them. These are as much vital powers as those of the stomach. If the sentient extremities of the nerves of the eye or ear be deranged by electricity, for example, sight or hearing are lost, but there the evil ends. If those of the stomach be so deranged, with the function of the stomach every other function of the system is lost; not in consequence of the failure of the digestive process, but instantly. If, instead of a chemical, we employ a mechanical agent,—a sudden blow, for example, the same difference of effect is observed. On the cause of this difference, whatever it be, it is evident that many of the symptoms of Indigestion depend, for the effects of the various states of the stomach, in the different stages of this disease, are instantly propagated to the most distant parts of the system. We see the extremities become hot or cold, moist or dry; the functions of the brain or heart immediately fail, and as quickly revive; according to the changes which are going on in the stomach, and the degree in which the nerves of this organ are affected by them.

So great is the power of the sympathy which exists between different parts of the system, not only in modifying, but in producing the symptoms of disease, that it is a point of no small consequence to ascertain by what laws it is regulated.

It has been an opinion from the time of Willis, that the sympathy which exists between different parts, depends on the connexions in the course of their nerves; and this opinion is still maintained by some of the best writers; but when we consider to what

inferences it leads, we shall pause, I think, before we give it our assent. It is known that the nerves convey impressions to and from the brain, to which we owe feeling and voluntary power. If we compress or divide the nerves of a limb, so as to cut off its communication through them with this organ, its sensation and voluntary power are lost. But we have no reason to believe, from the usual phenomena of the nervous system, that an impression made on the extremities of a nerve will, in its progress to the brain, so affect any other nerve, with which it may communicate, as to influence its extremities.

The first objection which presents itself to this explanation is, that is an unnecessary one. All nerves convey impressions to the source of nervous influence, and every nerve is capable of being influenced by this source. These are acknowledged facts, and they are capable of explaining the phenomena in question. It is possible, however, that some collateral facts may prove, that the former is the just explanation. Is it found that parts never sympathize unless their nerves are connected in their progress? Do parts, whose nerves are most connected, most sympathize? A crowd of facts reply to these questions. What connexion of nerves exists between a vital organ and the skin which covers it, between the liver and the ligaments of the shoulder, between the viscera of the abdomen and its parietes, the stomach and the cartilages of the ribs, &c.? Why does inflammation of the pleura of the ribs spread as readily, or nearly so, to that of the lungs, which is only in contact with it, as to that in continuation with it, which is supplied from the same branches both of nerves and vessels? Why is inflammation of the parietes of the abdomen, or of any part of the bowels, in like manner, as readily communicated to the part in contact with it, however little their nervous communications, as to that with whose nerves the nerves of the affected part most freely communicate?

These and various similar facts, as far as I can judge, leave no room to doubt that nerves sympathize only from their connexion in their common source, and that the numerous connexions we observe in their course are only useful in the same way with the

ganglions and plexuses, which may be proved by direct experiment to enable the influence, descending from that source, to pass from one nerve to another, so that one may partake of that which is conveyed by many, a power which, it may also be shown, is necessary to the continuance of life.* That the phenomena of sympathy depend on changes in the source of nervous influence,† would appear, I think from the fact alone, that sympathetic feelings still continue to be referred to a limb which is lost; because this seems to be a law of general application, at whatever part the separation takes place.

If we compare the foregoing facts with the result of experiments which prove, that the vital organs are supplied with nervous influence from every part of the brain and spinal marrow,‡ while the organs of sense derive theirs only from particular parts of them, it seems a necessary consequence, that the one set of organs can not be injured without influencing every part of the system, while in injuries of the other, only those parts of the general source of nervous influence, from which their own nerves arise being affected, the evil extends no farther.

It appears from what has been said, that juxta-position is one of the most powerful causes of parts partaking of the affections of each other. We see textures of the most dissimilar nature,

* *Experimental Inquiry*, Part II, Chapters 4, 5, 7. Sect. 2; and Chapter 9.

† I am happy in being able, in confirmation of the above position, to refer to a very able paper by Mr. Charles Bell, in the *Philosophical Transactions* of this year, entitled, "*On the Nerves; giving an account of some experiments on their structure and functions, which lead to a new arrangement of the system,*" which has appeared since the publication of the first edition of this treatise. In the above paper, Mr. Bell has pointed out the interesting fact, that some of the nerves which supply those muscles of voluntary motion, which sympathize with affections of the lungs, have their origin near that of the eighth pair: thus readily accounting for sympathies which have been generally ascribed to the connexions of the great sympathetic with other nerves; an explanation which wholly fails to account for those sympathies affecting only certain muscles.

I would take the liberty of suggesting that the above nerves, on the functions of which Mr. Bell has thrown so much light, should be named pnemo-gastric, instead of respiratory, for I think Mr. Bell will, on farther consideration, admit that the muscles in question equally sympathize with the stomach, and other abdominal viscera, as with the lungs; and we know that the eighth pair of nerves bestows its influence on the latter as well as the former organs.

‡ *Experimental Inquiry.* Part II, Chap. 9.

receiving their nerves and vessels from the most distant sources, immediately partaking of each other's affections if they lie together. Inflammation of the skin of the chest often spreads to the intercostal muscles, to the pleura of the ribs, to that of the lungs, to the lungs themselves. The same observations apply to the other cavities, for the interposition of bone itself does not always prevent this progress. This well-known fact is often of great consequence, in tracing the causes and explaining the phenomena of diseases. We shall find it so in the disease before us.

When the cause of injury applied to the vital organs is very great, as in the cases above mentioned, all parts of the system are equally affected, the power of all being immediately destroyed. But when the cause is comparatively slight, the effect on the parts, which most sympathize with these organs, may be considerable; while on others it is hardly to be observed. Thus the effects of irritation of the stomach appear in the liver, the skin, the head, when they are not to be perceived in other parts; but as the disease increases, as we find from the above enumeration of its symptoms, they become sensible in every part.

It appears from the experiments related in the seventh chapter of the above *Experimental Inquiry*, that any diminution of the extent of the organs which supply the nervous influence, affects the state of secreting surfaces, and impairs the temperature: and Mr. Brodie observed similar effects, particularly with respect to the temperature from powerfully debilitating causes affecting these organs. It can not, therefore, seem surprising, in derangement of the digestive organs, which so greatly debilitates the powers of the nervous system, and which when excessive, we have seen, is even capable of destroying those powers, that diseases of other parts of the body, and particularly of the skin, which so eminently sympathizes with those organs, should frequently arise, and be difficult of cure. It appears from the progress of Indigestion that, wherever sympathetic affections are long continued, or frequently renewed, actual disease ensues.

All that is here said is well illustrated by, and readily explains, Mr. Abernethy's valuable *observations on the constitutional origin*

of Local Diseases. He found that many wounds, which resisted all the means which the surgeon could employ, were attended with a disordered state of the digestive organs, and yielded readily when the due performance of their functions was restored; nay, that many wounds and other local diseases had no other origin than the states of health which attend irritation of the stomach and bowels.

It is also to be observed, that the failure of nervous power appears more readily in some of the nervous functions than in others. In Indigestion, before the other functions of the surface are much impaired, the patient complains of a sense of cold; and when by degrees, the failure of these becomes apparent, the sensation of cold, an actual reduction of temperature, and a less than natural ability to resist its extremes, still continue to form a predominant feature of the disease; for we have seen that dyspeptics are as unable to bear extreme heat as cold.

All this we still find strikingly illustrated by the operations of nature in other cases. It appears from the observations of Mr. Guthrie, in his work *on Gun Shot Wounds*, that when the nerves of a limb are injured, all its functions are impaired. It is more liable to ulceration than a sound part. Inflammation does not take its usual course in it, and wounds in it heal with greater difficulty than usual. A diminution of temperature, however, and an inability to resist changes of temperature, he observes are, from the first, the most striking features; and the limb remains below the natural degree for months, or even years, if the nervous influence is not perfectly restored.

The preceding observations show, not only that those symptoms of Indigestion which affect parts at a distance from the stomach, may arise from any other cause lessening the power of the nerves, whether acting as affections of the stomach do, on the whole nervous system, or only on the nerves of the parts chiefly affected; but that the order and general character of the symptoms, thus produced, are the same as when they arise from Indigestion; pointing out, in a striking manner, the similarity of their cause.

When the whole of the facts which have been laid before the

reader, in this and the preceding sections, are kept in view, it seems easy to point out in what way the remote causes of Indigestion operate in producing all the symptoms of what I have called the first stage of this disease. The debility induced by these causes on the muscular and nervous powers of the alimentary canal, on the one hand, by preventing the due change on the food, and its due discharge into the duodenum, and progress throughout the rest of the canal, produces the symptoms which immediately arise from undigested food; and on the other, either by its direct effects in the stomach and bowels, or through the irritation of the undigested food and vitiated secretions, excites the nervous derangements which affect these cavities themselves, or other parts with which they sympathize.

But in the second stage of the disease we see a change which can not be referred to either of these heads, I mean, the occurrence of tenderness in a certain part of the epigastric region above described, which hardly ever fails to supervene in protracted cases; and when considerable, to be accompanied with a pulse which will be found more or less hard, if examined in the way above pointed out,* and some of the other indications of fever which have been enumerated. I am now to lay before the reader such facts as seem to throw light on the more immediate cause and nature of those symptoms, which we shall find greatly influence the treatment of this disease.

I have had occasion to call the reader's attention to many facts which prove, that irritation is often felt in a part at a distance from that to which the irritating causes are applied. Now, whatever may be said of the way in which any cause of irritation affects the part to which it is applied, it is evident, that it can only affect a distant part through the medium of its nerves. Thus, when worms in the intestines produce pain of the chest, dyspnœa, &c., we know that these symptoms arise through the medium of the nerves, and by watching their effects we are enabled to determine, what the effects of mere irritation of the nerves are.

* Chap. I, page 17, *et seq.*

It appears, from what was said above, that this irritation, in the first instance, produces no sensible change in the part sympathetically affected. If the worms are removed from the intestines within a few hours after the pain, the dyspnœa, and other pectoral symptoms have supervened, they immediately disappear, and the lungs perform all their functions as well as if no symptom of disease had existed. But we have also seen, that if these sympathetic symptoms remain for a certain time, inflammation of the lungs takes place, and they exhibit, on dissection, all the marks of this disease, suppuration and its other consequences not excepted. Other instances of the same kind were adduced, and it would be easy to multiply them.*

* Since the publication of the first edition of this Treatise, Mr. Brodie has favoured me with the following letter, containing an account of an important experiment which he made many years ago, and some valuable observations, which seem strikingly to illustrate this part of the subject, and which he has had the goodness, at my request, to permit me to make public.

"My dear Sir,—The following are the particulars of the experiment to which you have alluded:

"On the 29th of June, 1814, I exposed the nerves of the eighth pair in the neck of a rabbit, and by means of a fine needle, I passed a silk thread transversely through the substance of each nerve, in the manner of a small seton. The extremities of the threads were left hanging out of the external wound. This operation did not produce any immediate effect on the respiration: but at the end of twenty-four hours the animal was observed to breathe in a laborious and difficult manner, twenty eight times in a minute. The threads were withdrawn, but the removal of them occasioned no relief, and fourteen hours afterwards the rabbit was found dead. On dissection both lungs were seen loaded with blood and inflamed. The left lung was inflamed in the greatest degree, the surface of it being encrusted with coagulated lymph, and lymph being effused also in several places in the intertubular substance and auricles. There was a considerable quantity of serum in the cavity of each pleura.

"The stomach and intestines were in a natural state, presenting no appearance of inflammation. The gall-bladder was nearly emptied. A slight degree of inflammation existed in each nerve; but only at the part where the seton had been introduced.

"It appeared to me that, in this experiment, the inflammation of the lungs might reasonably be attributed to the irritation produced by the threads on the nerves, by which they were supplied. A multitude of other circumstances might be adduced in proof of the doctrine, that simple nervous irritation is capable of producing local inflammation, even at a distance from the part in which the source of the irritation exists. A calculus passing down the ureter occasions pain in the testicle; and if a certain length of time elapses before the calculus escapes into the bladder, this symptomatic pain is followed by swelling, tenderness, and no small degree of inflammation in the testicle. In like manner, in some cases of disease in the hip, the symptomatic pain in the knee is attended at last by tenderness and puffy swelling

Thus it appears that irritation of the nerves of a part may exist for some time without any change taking place in the state of its circulation; and when the cause of irritation is not severe, and the part little disposed to disease, this may be the case for a long time. Pain of the shoulder often continues for months in chronic affections of the liver, without the shoulder becoming stiff or tender to the touch; but, it also appears, that the continuance of the nervous affection, sooner or later, according to its degree, and the tendency to disease in the part sympathetically affected, influences the state of its vessels. The effect, which thus takes place in a distant part, must, of course, take place more readily in that to which the cause of irritation is applied.

Now it appears from what was said in the second section of this chapter, that all the causes of Indigestion act either directly or indirectly, on the nerves of the digestive organs.

This irritation of the nerves must sooner or later produce the same effects here, as in other parts, and the vessels at length partaking of the disease, some tendency to inflammation must ensue. This is indicated by the symptoms above mentioned, a tenderness on pressure in the part affected, hardness of the pulse and other febrile symptoms, which under all circumstances indicate inflammation or a state approaching to it.

As the tenderness of the epigastrium is always the first of these symptoms, and the others are proportioned to it, and yield, as we shall find, to the means which relieve it, it is evident that these symptoms arise from the same cause which produces it. It is a point of considerable importance in the treatment, therefore, to ascertain the nature and seat of the affection, which occasions this tenderness.

of the latter articulation; and in many instances in which suppuration takes place slowly on the membrane of the brain, after an injury of the head, the patient becomes affected with inflammation and abscesses of the lungs, liver, or some other organ remote from the seat of the original malady.

"I have much pleasure in being able to communicate to you these observations, in confirmation of the opinions which you have expressed and published on these subjects; and I am, dear Sir, yours, very truly,

B. C. Brodie."

Saville-row, Oct. 26, 1821."

It is evident that of the different parts of the stomach, the pylorus is the one most exposed to the causes of irritation. Other parts experience the irritating effects of different portions of its morbid contents, but the pylorus is necessarily exposed to those of all. All must pass by this orifice. When therefore we see that, after Indigestion has continued for some time, a certain part of the region of the stomach becomes tender on pressure, we can not help turning our attention to this part. Now in the natural situation of the viscera, exactly in the tender part of the epigastrium, the pylorus lies, with the thin edge of the liver upon and in contact with it; as I have ascertained with the kind assistance of Mr. Brooks, whose anatomical skill is so generally acknowledged.

When all these circumstances are considered, can we doubt that it is the irritated pylorus assuming a low degree of inflammation which occasions the tenderness on pressure above described; and when we consider what has just been said of the influence of juxta-position in the spreading of this disease, can we doubt, when we find the tenderness with some degree of fulness gradually extending downwards, along the soft parts on the edge of the cartilages of the right side of the epigastrium, as we find it to do in the progress of Indigestion, and at length ending in evident enlargement and tenderness of the liver, that the affection of this organ, with which it is in contact, thence by degrees extending to its other parts? Thus it is that of all the neighbouring parts no other so frequently partakes of this affection of the stomach. It is doubtless in the same way, that the habit of drinking spirits, which must apply so great a degree of irritation to the pylorus, seldom fails to produce affections of the liver.

We have reason to believe that it is from its greater exposure to causes of irritation, that the pylorus itself is more subject to organic disease than any other part of the stomach; but the wise Author of our being seems to have given to a part necessarily so much exposed, a great power of resisting disease; so that the first deviations from the healthy state, which are communicated from it to the liver, more readily take root there, if I may be allowed the expression; and the structure of this organ yields to the affec-

tion which that of the part, from which it receives it, generally resists. The liver indeed is here already disposed to disease, its action we have seen from an earlier period, having by sympathy, been influenced by the state of the stomach; and the continuance of diseased action, we know, disposes to disease of structure.

I am well aware that the fulness of the right hypochondrium in Indigestion, even when combined with tenderness on pressure, does not always indicate an affection of the liver. It often, I believe, arises from the state of the duodenum, which frequently expels its contents with difficulty in this disease, and my experience corresponds with many of the observations made by Dr. Yeats in his excellent paper on this intestine, in the last volume of the *Transactions of the College of Physicians*.

It has been stated, in enumerating the symptoms, that the fulness and tenderness of the right hypochondrium in the early stages of Indigestion are often temporary. I have repeatedly seen them, even when they were considerable, disappear after the operation of a brisk cathartic. They must then arise either from a distended and oppressed state of the duodenum, or temporary distention of the various vessels of the liver. To which of these causes we should ascribe them, the accompanying symptoms will generally enable us to determine. The feeling given to the hand by the distended duodenum is different from that produced by the gorged liver, and in the former case the chief fulness is generally lower down, and does not seem to proceed so immediately from under the edge of the thorax as general fulness of the liver does; so that even where, from more permanent debility of the duodenum, its morbid distention is a more constant symptom, the two cases may generally be distinguished. The more temporary nature of both these affections, with the history and general symptoms of the case, for the most part readily enable us to distinguish them from fulness and tenderness of the same region arising from organic disease of the liver, which comes on slowly und uniformly, and the commencement of which, when it arises from Indigestion, may generally be traced to the epigastrium.

The observations which have been laid before the reader, as

far as I am capable of judging, leave no room to doubt, that an inflammatory affection of the pylorus, excited by the passage of the irritating contents of the stomach for a longer or shorter time, according to the nature of these contents, and the greater or less degree of inflammatory tendency in the part, is the cause of the tenderness observed in the epigastrium, and which at first is generally confined to a space not larger than a shilling; an inference confirmed by dissection, which often exhibits the internal membrane of the pylorus thickened in those who have suffered much from the disease of the digestive organs.

It appears from many experiments detailed in the introduction to my *Treatise on Symptomatic Fevers*, and which have been carefully repeated by Dr. Hastings* with the same results, that all the causes of inflammation act by debilitating the capillary vessels of the part, and thus allowing them to be distended by the *vis a tergo*, from which, as appears from what is said in the treatise just referred to, and last part of the *Inquiry into the Laws of the Vital Functions*, all the phenomena of inflammation seem necessarily to arise.

It is this debility of the finer vessels of the pylorus, therefore, produced by long continued irritation of its nerves, from which arise, in the second stage of Indigestion, the hard pulse and other symptoms of feverishness above enumerated, and by which, we shall find the successful treatment of this stage essentially influenced.

It is a point of great importance in the progress of disease, that febrile disease begins with inflammatory action, that is, debility and distention of the finer vessels, and their constant effect increased action of the larger ones, and at length necessarily produces debility of the nerves; while nervous disease begins with the latter, and as certainly ends in debility and distention of the finer vessels. It seems to be this which renders the chronic inflammation of organs so much more difficult of cure, and apt to run to derangement of structure, than the acute form of the disease. In the former, the functions of the part are more generally

* Dr. Hastings's *Treatise on Bronchitis.*

injured. Its nervous power is debilitated before its vessels begin to be distended. Besides, the debility of the nerves, and that of the extreme vessels tend to increase each other; and unless the chain of diseased action can be broken by means which enable the vessels to recover their healthy diameter, it goes on more or less quickly, sometimes, if the symptoms are mild, very slowly, till the structure of the organ is destroyed.

The inflammatory action in Indigestion, partaking of the chronic nature of the disease it belongs to, often, in the first instance, attracts so little attention, that the stimulating plan, which we shall find suited to the first stage, is sometimes pursued till organic derangement at once announces to the practitioner the danger of the patient, and the necessity of adopting other principles of treatment. But as such an inflammatory state as that we have been considering may always, I believe, be observed to precede organic derangement of vital organs; and, both on this account, and for other reasons, appears to be its immediate cause; it is of the utmost consequence, in preventing that derangement, to watch the first appearance of inflammatory action, for it is at the beginning alone that it can be effectually counteracted. The period at which it shows itself, we have seen, is very various, a circumstance which has doubtless contributed to obscure this part of the disease.

While the foregoing changes are going on in the solids, the fluids of the body must necessarily undergo corresponding deviations from the healthy state. In proportion as the flow of nutriment into the blood is lessened, the chyle itself probably more or less vitiated, and as the different secretions fail, the circulating fluids must be subject to various changes. What these are the present state of our knowledge makes it impossible to ascertain.

In those who have long laboured under Indigestion in its more severe forms, the blood is sensibly altered in some of its properties. The proportion both of red globules and lymph is less than in health. This state of the blood must necessarily affect that of the fluids supplied to secreting surfaces, and from this cause also,

the secretions of the digestive organs must further deviate from the healthy state.

In considering the mutual action of one part of the system on another, the state of the mind deserves particular attention in Indigestion. The disease itself we have seen seldom fails to render it anxious, irritable, and apprehensive; and this state of mind, which we have found ranked among its causes, can not fail to influence its symptoms.

When the reader reviews the various facts which have been laid before him relating to the operation of the remote causes of Indigestion, and particularly takes into the account what I have frequently had occasion to recal to his recollection, that the morbid states of all those parts sympathetically affected, till actual disease takes place in them, operate as secondary causes of the primary affection, both by sympathy, and by their farther weakening the general powers of the system, he will perceive how complicated the operation of its remote causes must be; and indeed by reflecting on the nature of the animal body, the great variety of parts of which it consists, the different nature of these parts, the variety of functions necessary to produce each individual result, and the variety of causes which may influence each organ in this complicated structure, we are prepared for such a conclusion.

When the motions of a clock are suspended, we find a wheel clogged, and readily perceive how this cause of derangement has destroyed the action of the machine; because its action depends wholly on one principle, and consequently all causes impeding its motion must affect this principle. But did the nature of the clock include many principles of action, and were the cause of disorder such, as might influence several or all of them, we should seldom finds its effect confined to the derangement of one part: yet, even then the effects of the offending cause would be simple compared to those of a cause of disease, for to bring the machine into a state analogous to that of the animal body, and render the effect of its offending causes equally complicated, its different principles of action must not only have some of them a direct, and

all an indirect, dependence on each other; but besides this dependence for their actual existence, each must in a greater or less degree be capable of influencing every other, and in such a way, that the secondary affection re-acts on the part first impressed by the offending cause.

In a machine so constituted, until we could trace the manner in which the different principles of action depend upon and affect each other, what possibility would there be of ascertaining the change which any cause of derangement had occasioned in it, and there could surely be no expectation of finding it in the disorder of any one part. How vain then was the humoral pathology, and how vain that of the simple, or even of the living solid, although the last, which we owe chiefly to the labours of Hoffman and Cullen, must be regarded as an important step towards a true view of the nature of disease.

All the parts of a living body are concerned in its diseases, and it is only as we advance in a knowledge of those various parts, and their relations to each other, that the nature of its deviations from a state of health can be understood.

from p. 70 to p. 117. -

CHAPTER III.

OF THE TREATMENT OF INDIGESTION.

The treatment of Indigestion, like its symptoms, may be divided into three parts, that of the first, second, and third stages of the disease. The two first only, for reasons already given, we are here to consider.

SECTION I.

Of the treatment of the first stage of Indigestion.

The first object in the cure of all diseases is to remove the remote causes as far as they still continue to operate. Among those of Indigestion, we have seen, that whatever occasions morbid distention of the stomach, or irritates its surface, holds a chief place. It unfortunately happens, that there is a continual tendency in this disease to produce those causes. However well, therefore, we may succeed in removing them, it requires constant attention to prevent their recurrence. It also appears from what has been said, that these observations apply with almost equal force to some of the other causes of this disease, particularly to that inactivity of body and irritable, anxious and desponding state of mind, which so frequently cause, and are caused by, Indigestion.

The first part of the treatment, therefore, which falls under our attention, relates to diet and exercise both of mind and body; and in the slighter and more recent cases a strict attention to these alone, or at most with the assistance of an occasional mild aperient, will often be found sufficient to effect the cure; and the

neglect of them will, in all cases, tend to counteract whatever other means we employ.

Of the diet in Indigestion.

The objects to be kept in view in regulating the diet in this disease, as appears from what has just been said, are that it shall tend as little as possible to produce either morbid distention or morbid irritation of the surface of the stomach.

Many of the regulations belonging to the first of these heads arise out of what was said in the section on the immediate causes of Indigestion. It would appear from the observations there made, that the appetite continues till the first food neutralizes the gastric fluid which had accumulated in the stomach and caused the sensation of hunger. If the patient eats with great rapidity, he will, during the time required for this combination, put such a quantity of food on the stomach as to occasion some degree of morbid distention, which will be greatly increased by the swelling of the food, in consequence of digestion being impeded by the distention; while the stomach, at the same time, for reasons above explained, does not, with the usual facility, propel it into the intestine. Thus it is that the feeling of distention often increases for some time after too full a meal, and, at length, is frequently accompanied with actual pain.

The food, when we eat too fast, is not only received into the stomach in too great quantity, but is swallowed without being duly masticated and mixed with saliva, and therefore without properly undergoing what may be considered the first process of digestion. It is thus presented to the stomach in a state, in which the gastric fluid pervades, and consequently acts upon it with more difficulty. In this way eating too fast is injurious even when the patient abstains from taking too much. For these reasons, to eat moderately and slowly, is often found of greater consequence that any other rule of diet. The dyspeptic, in eating, should carefully attend to the first feeling of satiety. There is a

moment when the relish given by the appetite ceases; a single mouthful, taken after this, oppresses a weak stomach. If he eats slowly, and attends carefully to this feeling, he will never overload the stomach.

Morbid distention of the stomach, however, may take place, although there be no error in either of these respects, if the food be of such a nature that the fluids of a weak stomach are unable to effect the necessary change on it, in consequence of which it runs into fermentation.

It is evident that morbid distention, from whatever cause, can not exist without, at the same time, occasioning morbid irritation of the surface of the stomach. The distention itself has this effect, but as deranged digestion is the consequence of this degree of distention, it can never stop here. All undigested food, however small the quantity, is a cause of irritation.

Thus the whole train of symptoms, which constitute a fit of Indigestion, may arise either from too large a quantity of food, particularly if carelessly masticated, or from food of difficult digestion, most readily of course from a combination of these causes. It is, therefore, of great consequence, in regulating the treatment of this disease, to ascertain what kinds of food are most easily changed by the gastric fluid. This is sometimes influenced by peculiarities of constitution, to which no general rules will apply, but it is not difficult to perceive, what kind of diet is usually best suited to a weak stomach.

Tough, acescent, and oily articles of food, with a large proportion of liquid, compose the diet most difficult of digestion. It would appear that a feeble gastric fluid, as indeed we might *a priori* suppose, does not admit of being greatly diluted without having its powers much impaired. The diet opposite to this, then, is that which agrees best with dyspeptics. In the first stage of Indigestion, a diet, composed pretty much of animal food and stale bread, is the best.

If we except beef and veal, the flesh of old, in general, is more easy of digestion than that of young animals, on account of the greater quantity of mucilage in the latter. All mucilages are of

difficult digestion. Even the vegetable mucilages, which in small quantity are generally grateful to the stomach, will oppress it, if taken very freely. They are among the things which, in vulgar language, are called sating, or phlegmy. Whatever produces the feeling known by these terms disagrees with the stomach.

The stronger kinds of animal food, of which beef may be considered the strongest, are most apt to excite fever. On this account we often allow those, recovering from fever or otherwise disposed to it, to eat the animal mucilages, or those meats which contain a great proportion of them, when even mutton for example is forbidden. Thus animal jellies and young meats have obtained the name of light, but this only relates to the tendency to produce fever, for as far as digestion is concerned they are heavier than mutton, and to many stomachs than beef. A similar observation applies to the vegetable, compared with the animal kingdom; the former are less apt to excite fever, and are therefore called lighter, but they are in general more difficult of digestion.

From what it arises that mutton is to most stomachs so much more easy of digestion than beef, it would be difficult to say. Most kinds of game are of easy digestion. Fish, independently of the heavy sauce with which it is eaten, is, for the most part, less easily digested than the flesh of land animals; and as it at the same time affords less nutriment, it is in both respects less proper for the food of dyspeptics; although from the white kinds being less apt to excite fever, they, like the animal mucilages, have obtained the name of light, a term which so often deceives with respect to what is most easy of digestion, that it is necessary to keep this explanation of it in view.

The meat most mixed with fat, is, *cet. par.*, most oppressive. It is on this account that pork and the tongues of many animals are of difficult digestion. For the same reason, geese and ducks are the most oppressive kinds of poultry. Turkey is more so than fowl, which, next to mutton, is, perhaps, upon the whole, the lightest animal food in common use, if the skin be avoided. Of the different kinds of game, pheasant is least easy of diges-

tion. The lean part of venison is, perhaps, the most digestible article of diet. Hare and partridge appear to be as much so as mutton.

Eggs, as far as relates to a tendency to produce fever, may be regarded as of a middle nature between animal and vegetable food. It is a common opinion that they disagree with bilious people, that is, people labouring under Indigestion, in whom the disease has extended to the function of the liver. This opinion, in general, I believe, is ill-founded, if they are eaten soft boiled with stale bread. In this state, although offensive to a few stomachs, they, for the most part, are easy of digestion, if the patient confines himself to one, or at most two, and are an agreeable change.

Few things are of more difficult digestion than new bread. This observation applies to every thing which by mastication forms a tenacious paste, which is not easily pervaded by the gastric fluid. So difficult of digestion is such a paste, that I have known more than one dyspeptic, whose stomach could only digest new bread, when it was soaked in melted butter. Here one of the articles most difficult of digestion, was more easily digested than the tenacious paste which its presence prevented. Even bread sufficiently old is oppressive if taken alone, and in large quantity, it still forms a mass not very readily pervaded.

On the same principle, food is often rendered more indigestible by processes employed with a view to assist the stomach. All articles composed of strong jellies, and food carefully mashed are oppressive. The coarser division which our food undergoes in mastication is better suited to assist digestion. Most dyspeptics find, that potatoes, for example, finely mashed, although without any admixture, are more difficult of digestion than when properly masticated. During mastication the saliva is freely mixed with them, and a mass is formed easily pervaded. When they are mashed, they resist admixture with the saliva, as well as the gastric fluid.

Our food is rendered more easy of digestion by simple roasting or boiling, provided it is not too much done. Beyond this, the

art of cookery is nothing, but that of pleasing the palate at the expense of the stomach. There are a few circumstances under which it is proper to bribe a patient to eat; under all others, the refinements of the cook are at variance with the objects of the physician. However imposing the plans of concentrating much nutriment in small compass may at first view appear, we may be well assured, that in such concentration something is taken away from what nature designed for our food, which is useful to us.

It is not generally known, that the most concentrated decoction of beef, so far from affording much nourishment, will not, if unmixed with something solid, even allay the appetite. A person under my care was attacked with a severe pain of the face when even the smallest quantity of any solid food was put on the stomach, a single mouthful of bread never failing to bring on the attack; and, as he at length refused all solid food, he was confined for some weeks to a strong decoction of beef; but, however strong, and in whatever quantity it was taken, it never relieved the calls of hunger, and he rapidly emaciated.

Fresh vegetables, on account of their tendency to ferment, are, on the whole, injurious in Indigestion. Some vegetables, however, are more so than others. Peas, beans, cabbage and waxy potatoes, I have found the worst. Mealy potatoes, turnips, and broccoli, among the best. They should always be boiled till they are soft; raw vegetables of all kinds are oppressive; lettuce appears to be the least so. The tough, thready, and membraneous parts of vegetables are of most difficult digestion.

Fruit are also difficult of digestion, particularly the cold fruits, melons, cucumbers, &c.; next to these, the mucilaginous fruits, gooseberries, pears, &c. Apples and strawberries I have found, on the whole, lightest; but we more frequently find peculiarities in the stomach with respect to fruits than other articles of diet. To many stomachs the most acescent fruits, currants, mulberries, &c., are particularly offensive. All preserved fruits are oppressive,—the large proportion of sugar adding much to their indigestible quality. To some dyspeptics sugar is so oppressive, that I have known several who were obliged to abstain even

from the small quantity used in tea. Most stomachs bear acids better than acescents.

Bread is not the worse for being hard, provided it is properly masticated. All hard and tough animal food, particularly if it be salted, which adds to its hardness, is of difficult digestion. It seems to be from its hardness that smoked meat is oppressive. Hard and tough animal food can not, by mastication, be reduced to the loose pultacious form which hard bread assumes.

There are few things in common use so oppressive as butter. It appears to be more so than the fat of meat. The fat of mutton is less difficult of digestion than that of beef, and the fat of venison less so than either. The same may be said of the fat of turtle, but all kinds of fat are oppressive to a weak stomach, and that of which we are inclined to eat the most is generally, on this account, the worst. We have little experience of oil in this country. Could I trust the result of a few instances, I should say that olive oil, to a stomach accustomed to it, is less oppressive than butter, probably than most kinds of fat.

All oily substances are rendered more oppressive by being fried, as in many of our dishes; yet, such is the peculiarity observed in particular cases, that I have known a dyspeptic digest fried bacon pretty well, who could not digest mutton; as if the strong stimulus of the former excited a secretion of gastric fluid, where the milder stimulus of the mutton failed. It seems to be on this principle that the stomach will often digest a little of any thing for which the patient greatly longs, and that the appetite sometimes increases after we begin to eat.

Cheese is, in general, still more difficult of digestion than either butter or fat. With their oily nature, it combines the hardness and toughness of the dry and compressed curd, which is very difficult of minute division. Milk and cream, with their preparations, are generally oppressive in proportion to their richness: but the same proportion of cream mixed with water is more digestible than milk.

Much seasoning is injurious, both by the unnatural excitement which it occasions, by which it, for the time, increases the power

of the stomach, at the expense of subsequent debility; and by inducing us to eat too much. It also, like other strong stimulants, has a more direct tendency to induce the second stage of the disease.

With respect to fluids, water is evidently intended for the proper dilution of our food. As, on the one hand, we have seen the food may be so watery that it too much dilutes the gastric fluid; so, on the other, it may be so dry, that this fluid can not easily pervade it, and its necessary motions in the process of digestion are affected with difficulty.*

But these are not the only, nor do they appear indeed to be the principal, purposes for which we are induced to drink, which seems generally to be, to supply the waste of moisture occasioned by the various secreting surfaces, and particularly by the skin, which is the most extensive; hence every thing which promotes perspiration increases thirst. For a similar reason diarrhœa, and the operation of a cathartic have the same effect; and it appears from many facts, that there is often a rapid absorption of fluid from the stomach.

In health, when the various functions are in due proportion, little liquid is required with the food, the inhalation by one set of vessels nearly compensating for the exhalation by others. Thus it is that the most healthy are little troubled with thirst. In Indigestion, we have seen it is a frequent symptom. It seems sometimes to arise from a general failure of the secretions of the alimentary canal, from the mouth downwards, more frequently from irritation of the stomach, excited by the undigested food; for there is a false thirst, as well as a false appetite. As that irritation frequently induces the patient to eat when there are no fluids in the stomach adapted to the office of digestion, it excites him to drink when there is no want of fluidity in the various juices of the body; and when so far from there being a want of liquid in the stomach, it is surcharged with vitiated fluids.

* Besides the gastric fluid, properly so called, we have reason to believe that the stomach, like other secreting surfaces, forms a bland fluid for the purpose of defending itself to a certain degree against the irritation of its contents. This fluid may also be of use in promoting the necessary motions of the food.

The drink, under such circumstances, only giving relief in proportion as it dilutes the irritating matter, the thirst returns as soon as its irritating properties again increase by its continued fermentation, or perhaps merely as soon as the stomach has become accustomed to the degree of relief which the last draught procured. In this way dyspeptics often drink vast quantities, greatly distending the stomach and increasing their disease.

There is some difference of opinion respecting the propriety of drinking at meals. It is evident from what has been said, that the necessity of drinking must be different under different circumstances; but in general it is best shown by the degree of thirst, and there can not perhaps be a more erroneous idea than that, which induces some people to drink during meals, for the purpose, as they say, of assisting digestion, when they feel no desire for it.

Drinking water can in no other way assist digestion than by affording the proper degree of moisture to the food. If there be no thirst, we may be assured that it already possesses this degree of moisture, and that any addition to it will only dilute the gastric fluid, and consequently enfeeble its solvent power. I have often observed, that eating too fast causes thirst, the food being swallowed without a due admixture of saliva, the mass formed in the stomach is too dry. It is almost unnecessary to observe, that the liquid taken after food must but imperfectly answer the purposes of that mixed with it during mastication.

The best rules, I believe, which a dyspeptic can follow, are not to yield to every slight sensation of thirst, and when the sensation is considerable, to take but a moderate quantity, and that deliberately, for it is with drinking as with eating, if he swallow with too great rapidity, he will take too much.

Such appear to be the regulations respecting liquids most consistent with the nature of indigestion, when the fluid possesses no other properties but those of quenching the thirst. If it possesses other properties, other circumstances demand consideration. Both nutritive articles of diet and stimulants may be received in the liquid form.

I have just had occasion to observe, that the most nutritive fluid alone will neither satisfy the appetite nor afford due nourishment. When we reflect on the facts above stated relating to the manner in which digestion is performed in man and the animals most similar to him, we shall easily perceive why liquids alone are incapable of affording sufficient nourishment. We have seen, that that part of the food which lies next the stomach having duly undergone the action of the gastric fluid, is moved onwards towards the pylorus, while that next in succession is in its turn applied to the surface of the stomach, where it excites a further secretion of gastric fluid, undergoes its action, and in like manner is moved onwards towards the pylorus.

That the motions necessary for these purposes may be readily performed, a certain degree of moisture is necessary; but if the contents of the stomach be wholly fluid, it is evidently impossible that such a process can go on with any degree of precision. The fluid can not be so changed as to present a constant and regular succession of food, comparatively fresh, to the surface of the stomach; there will not, therefore, be the same stimulus to excite to a continued secretion of gastric fluid, and what is secreted will be too easily diffused through the liquid contents of the stomach, to make the proper impression on any one part; the same must necessarily happen to the more digested part in its passage to the pylorus; it must be more or less diffused through the other contents of the stomach; in short, no part will be duly digested. The gastric fluid, being too much diluted for its function, is rather diffused through the contents of the stomach than neutralized by them, hence the appetite is never perfectly allayed, and little nourishment afforded. Thus the effects of liquid food tend to confirm the view of digestion afforded by the facts, which have been laid before the reader.

When nutritive fluids, however, are mixed with solids, although of a less nutritious quality, they afford sufficient nourishment. Strong broth, mixed with bread, or any other solid article of food, is sufficiently nutritious; but it is by no means the form, as appears from what has been said, in which nutriment

should be presented to a weak stomach, unless the appetite or irritability of the stomach, as sometimes happen, be such that solid food can not be taken. The proportion of liquid is too great, if there be much broth in the mixture; and if not, it approaches too much to the nature of the mucilaginous paste, to permit the digestive fluids to pervade it with ease. Thus all kinds of broth are apt to become sour on a weak stomach, and to cause other things to run into fermentation. When liquid nutriment is taken, as soups and broths usually are, before other food, it has the additional bad effect of inducing us to eat too much.

The diet of the dyspeptic should not only be well chosen, but simple. Variety is always an inducement to overload the stomach, and indeed so intermixed are the feelings produced by the calls of hunger, and by the means which please the palate, that, when the desire to eat is constantly renewed by a succession of different kinds of agreeable food, it is impossible to judge when we have received the proper supply.

We have reason to believe that by such means an actual increase of secretion is produced in the digestive organs, and thus an artificial appetite, if I may use the expression, excited at the expense of subsequent debility; which, although it may not immediately show itself by symptoms of Indigestion, which also is common, at length, in the majority of people, weakens the digestive powers.

With respect to stimulating fluids, the operations of the most innocent of these seems to be confined to the digestive organs. The various aromatic waters, ginger-tea, &c., seem only to be objectionable in the same way that other kinds of seasoning are, and we shall find, that in certain states of Indigestion they are useful, in giving temporary tone to the stomach and bowels.

The most pernicious fluid of this class, it is well known, are those which owe their stimulating property to the presence of alcohol. When taken in considerable quantity, they not only more, perhaps, than any other stimulants, injure the digestive organs; but extend their pernicious effects to other parts of the sys-

tem, to which we have reason to believe, they are immediately applied by means of the absorbents.

Like most substances capable of powerfully affecting the animal frame, they possess valuable as well as pernicious qualities; and, were the former of these less eminent than they really are, so general is their use in one form or other, and in most people the habit which requires their continued use, so fixed, that they seldom can be wholly withdrawn, except in very early life, without doing more harm than good.

All will agree that alcohol in every shape is unnecessary to those who are in health, and have never been accustomed to the use of it; and that had no beverage but water ever been known, however we might feel the want of a stimulus, in many cases, doubtless, the most valuable we possess, a great number of the most fatal diseases we are subject to, would have been less frequent; but these are not the questions before us. Our object is, to inquire what is the best for dyspeptics, as we find them in the habits of society which prevail in this country.

As these habits are such, that more or less alcohol is necessary to support the usual vigour of the greater number of people, even in health, nothing could be more injudicious than wholly to deprive them of this support, when they are already weakened by disease, unless it could be shown that even a moderate use of it essentially adds to their disease; which in the instance before us, we shall find, is by no means the case with respect to all the forms in which this stimulus may be taken.

As dyspeptics then, who have been accustomed to its use, can not be deprived of it, and as, under certain circumstances, it is even a useful remedy, we are here to inquire how far it is found so in Indigestion, and how we can best secure its beneficial and avert its evil effects.

There appears to be an essential difference in the effects of alcohol, such as it exists in fermented liquors, and after it has been distilled from them. Both have their inconveniences. So apt is the latter to injure the tone of the stomach, that, were it not that it is necessary for the solution of certain medicines, frequently

beneficial in Indigestion, we might, without hesitation, banish it from the treatment of this disease; with the exception of those cases, in which all kinds of fermented liquors, which have not been distilled, increase the symptoms, and the patient's habits render the use of alcohol in some form indispensable.

In the fermented liquors which have not been distilled, on the other hand, the alcohol is often combined with substances of difficult digestion, which are particularly felt by the dyspeptic. This is most remarkably the case with malt liquor, of which even the weakest kinds often increase the symptoms of Indigestion, and the strongest are among the most Indigestible articles of diet. The same objection, though in a less degree, exists with respect to the other fermented liquors of this country. Of these cider is the best, provided the acetous fermentation has not commenced in it. Perry usually contains too much mucilage, and some kinds are very oppressive to the stomach, apparently from this cause. The home-made wines are still more objectionable, being still more apt to run into the acetous fermentation.

The form in which alcohol is most beneficial, and in general does least harm, is that of foreign wines. The properties of these are various, and different kinds suit different stomachs. The astringent property of port wine seems to give it a peculiar tonic power; and, if it do not constipate, there is, perhaps, no other wine so well suited to dyspeptics. It should not be drank till of a certain age, the tartar of new port-wine being offensive to the stomach. Some dyspeptics find it, as well as the other stronger wines, agree better with them, when diluted; and others find the lighter wines, particularly claret, better; while with others, all the lighter wines, and even port-wine, are acescent. Even in these cases, however, the effects of the stronger wines are often improved by diluting them. Of this and many other circumstances in diet, each individual must judge for himself, as there is no rule of general application.

Many stomachs seem to feel the bad effects of the distilled spirits, which, it is said, are added to the stronger wines; for even the most objectionable of all the fermented liquors, which have

not been distilled, appears to be less pernicious than any of those which have undergone this process. I have known dyspeptics so sensible to the bad effects of the latter, that they have felt an increase of debility for several days after drinking a single glass of spirits and water. This does not arise from its oppressing the stomach, it even for the time assists digestion, and that, if the quantity taken be not too great, to a considerable degree, a property indeed which belongs more or less to all fermented liquors, though not in the same degree to those which have not been distilled. It is this unnatural excitement that seems to do harm. It is followed by a corresponding debility; and whatever be the change induced by distillation, there are no facts, I believe, better ascertained, than that the same quantity of alcohol in the form of distilled spirits, although equally diluted, both by its immediate operation, gives more temporary assistance to the stomach, and by its secondary effects, hurts it more, than in that of any fermented liquor which has not been distilled.

It is thus that many dyspeptics, whose digestion is disordered by all kinds of wine, can drink diluted spirits. But it is impossible by any addition to make their permanent effects similar to those of wine. Those addicted to wine seem often to be destroyed by excess of nutriment. They become full, often ruddy, at least for a certain time even robust, and not unfrequently die of sanguineous apoplexy. Those addicted to spirits, on the contrary, generally become pale, often emaciated, and more or less paralytic; and although both are subject to debility of stomach, obstructed liver, and dropsical affections, the latter soonest fall into those diseases, and in them they make the most rapid progress.

A very moderate use of wine can hardly be said to be injurious; we see those who use it in this way, live as long, and enjoy as good health, as those who wholly abstain from it; and to some constitutions, independently of the effects of habit, it may be useful. I believe neither of these observations apply to distilled spirits, although as already hinted, when the stomach has been greatly weakened by excess, so that it can not digest any fermented liquor which has not been distilled, the effects of diluted

spirits are often less injurious, than the total collapse of the system which ensues on wholly withdrawing the accustomed stimulant.

The best thing to be done in such cases is, to give no more than is necessary, and that in the most diluted form which is consistent with the debilitated state of the stomach. The usual additions of lemon and sugar which are supposed by many to bring the spirit into something like its state previous to distillation, according to my experience, only increase the evil, by adding to the hurtful stimulant, articles of difficult digestion, without at all ameliorating its properties. When it is necessary to use distilled spirits, I have found it the best plan to let it be as pure as possible, and mix it with nothing but water. I have known more than one instance, in which the stomach was even sensible to the difference between coloured and colourless brandy.

Tea and coffee are injurious in another way; they possess a narcotic power, which, we have seen, when considerable, is capable of producing Indigestion. By many they are regarded as a fruitful cause of this disease, but their effects on the whole have, perhaps, been over-rated. Green tea, and a very strong infusion of black tea or coffee, are injurious to many stomachs. I have repeatedly seen severe fits of Indigestion induced by them, always characterized by a greater than usual degree of nervous affection. To many, however, even these, and to most people, a weak infusion of black tea and coffee, seem to be innocent. They produce no present bad effects, and, where this is the case, I have never been able to perceive any proof of their continued use, doing harm. It is remarkable that their peculiarly refreshing sedative effect is generally, in the first instance, felt even by those with whom they most disagree. If drank very hot, they, of course, produce the effects of other hot fluids, which we are presently to consider.

It is by no means a fair inference, that what produces very injurious consequences in some, must do more or less harm in all. We frequently see articles of diet, and still more frequently, me-

dicines, which can not be borne by one stomach, perfectly innocent to another.

The tendency of tea and coffee to prevent sleep in many people, for even this effect is by no means universal, must be injurious as far as the want of sleep is so. It is generally in those in whom they produce most of this effect, that their other injurious effects are most apt to appear.

There has been some difference of opinion respecting the proper temperature of the drink of dyspeptics. Some, from the present relief obtained from fluids drank very warm, have recommended a high temperature; but the relief thus obtained is, like that obtained from distilled spirits, generally compensated by subsequent debility. When fluids of the usual temperature of the air, are too cold for a weak stomach, which is frequently the case, there is no objection to raising them to any degree that does not exceed that of the body; although, when the stomach bears it well, fluids of the common temperature seem rather to have a tonic effect in Indigestion. A very low temperature is objectionable. I have already had occasion to observe that fits of Indigestion may be induced in weak stomachs by iced fluids.

I have had occasion, in the preceding observations, to point out the impropriety of dyspeptics eating too fast or too much, or using too liquid a diet; the due repetition of their meals also deserves particular attention.

It is evident from what has been said of the process of digestion, that a considerable time must elapse after a tolerably full meal, before the more central parts of the food undergo the action of the gastric fluid; but, as we are not prompted to eat, till there is some uncombined gastric fluid in the stomach, it is evident, that it is the intention of nature, that we should abstain till some time after all the food already taken has undergone the action of this fluid. The accumulating gastric fluid having then no more undigested food presented to it, begins so to affect the stomach as to occasion the sensation of hunger. The recurrence of this sensation, therefore, must be the proper indication, that a due time has elapsed since the last meal.

Now this will be different under different circumstances, so that it is impossible to lay down any rule of general application; but it can never be very soon after an ordinary meal, except where the digestion is more rapid than natural, which sometimes happens. The patient must be careful to distinguish between a real appetite, and a desire to eat what is agreeable, a mistake by which we often see the stomach oppressed. On the other hand, it is injurious to a weak stomach long to bear the calls of hunger.

It has appeared to me that, with the generality of dyspeptics, to take three moderate meals in the twenty-four hours is the best rule. A few, particularly those who are much troubled with a sense of depression and sinking, find four meals better. The last meal should always be taken a little before bed-time, and should never, particularly after the disease has continued for some time, consist of animal food. The dyspeptic should eat nothing in the intervals of these meals. There is no greater mistake than that he should constantly be taking something. This disturbs the natural process, and entirely prevents the recurrence of appetite, a certain degree of which is a wholesome stimulant to the stomach. The stomach by this constant eating becoming more and more debilitated, and every part by sympathy partaking of the debility, the patient wholly misapprehends the cause; and with a view to increase his strength, still increases the frequency of his meals, till he hardly passes a couple of hours without eating. By such a practice, pursued for years, I have repeatedly seen debility of the stomach and a morbid irritability of the whole system established.

It is not, however, to be overlooked, that there are cases of urgent debility, both in this and other diseases, in which it is for the time necessary that the patient should take little and often. Sometimes the stomach can bear so little food at one time, that were the usual intervals of meals observed, due nourishment would not be received. But it is not sufficiently attended to, that in such states, in proportion as the quantity of nutriment received is lessened, the waste is lessened at the same time. The languor of the digestive organs is communicated to other parts of the system, and, if the organs of supply are inactive, those of waste are affect-

ed in a similar way. A due attention to this fact would often prevent the friends of the invalid urging him to take food against the appetite, which seldom answers any other purpose but that of oppressing the stomach. When it is necessary to eat very often, every care should be taken, by recurring, as soon as possible, to a better plan of diet, to prevent the habit of very frequent eating, being formed.

Among the other evils of this practice, an artificial want arises, and if the patient is not continually taking food, he feels a sense of sinking, which persuades him that its constant reception is necessary to his existence. Such patients can only be restored to regular meals by very gradually increasing the intervals of eating. An argument is adduced from the general good condition of cooks, for eating little and very often, but, it is forgotten that a healthy stomach and robust frame will bear many irregularities, which overwhelm a less healthy or more feeble one. We might as well adduce the fact of healthy people being most nourished by oily food, as an argument for feeding the dyspeptic with butter and fat. No doubt by this constant eating, a great deal of food may be taken, and a strong and healthy stomach, notwithstanding the way in which it is taken, may digest it; but we are here inquiring into the means of best assisting a weak stomach.

I have dwelt the longer on this and other similar points, because I have found them essential to the proper treatment of the dyspeptic; and, like the process of digestion itself, they have not perhaps obtained all the attention they deserve. The study of the two subjects, indeed, must go hand in hand; without a correct knowledge of the healthy function, it is evidently impossible to perceive the principles, on which this part of the treatment of its deviations from the healthy state should be founded.

In the foregoing observations on diet, the attention has been chiefly confined to its effects on the stomach, but its influence on the bowels of the dyspeptic ought not to be overlooked. Indigestion, we have seen, is generally attended with languid bowels; and, as far as the stomach admits of it, it is proper to make the

diet such, as tends to counteract this state of them. A vegetable diet is less astringent than one composed chiefly of animal food, and fresh vegetables are more aperient than bread. But this must not be carried too far; it is better to take aperient medicines than disorder digestion by an improper diet. I have in several instances seen advantage from eating household bread, mixed with a certain proportion of rice, previously softened by boiling. This admixture, contrary to what might be expected, renders the bread aperient, but it also, in general, renders it more difficult of digestion. It is also for the most part rendered more aperient by allowing part of the bran to remain in the flour.

When there is much irritation of the bowels, mucilaginous fluids, in such quantity as does not oppress the stomach, are useful, even butter and fat are occasionly useful in this way; but, in general, any considerable quantity of them so disorders digestion, as more than to compensate for their effects in the bowels; and not unfrequently the disorder they produce in the secreting power is such, that the contents of the bowels become more irritating than they were. I have known many dyspeptics, in whom the use of butter always had this effect.

When diarrhœa seems rather to arise from a degree of relaxation of the bowels than from the nature of their contents, it is proper to use articles of an astringent kind, such as rice seasoned with cinnamon. But it is a great error in the treatment of this disease, immediately to check diarrhœa, for it generally arises from irritating matter, the retention of which would be injurious.

Upon the whole, however, it is to be observed, that the diet best suited to the stomach is generally found best for the bowels also; their disorders in this disease, if we except a degree of languor, generally arising from the vitiated secretions, which attend disorder of the former.

Of exercise in Indigestion.

The excercise both of mind and body demands particular attention in the dyspeptic.

The different kinds of bodily exercise may be arranged under three heads; that in which the body is moved by its own powers; that in which it is moved by other powers, as in the various modes of gestation; and that in which the circulation is promoted without moving the body, by friction for example, or merely by pressure.

The dyspeptic may be so weak, that friction is the only kind of exercise which he can bear without fatigue. Wherever the strength is much reduced, indeed, although a little of some rougher exercise may be borne, friction is always useful. It is the principal exercise among the higher ranks of some Asiatic nations, and it was used both by the Greeks and Romans after they became luxurious. It would not be proper in Indigestion to confine the friction to the abdomen, when it is the only mode of exercise, although in such cases it should be carefully applied to this part. To dyspeptics in general, whatever be their other modes of exercise, friction of the abdomen is always useful.

Mere pressure is a mode of exercise inferior to friction; but, if generally applied to the limbs in an interrupted manner, from the valvular structure of their veins, it has a considerable effect in promoting the circulation.

As the total want of exercise is not more pernicious than that which occasions fatigue, and no exercise is very beneficial which can not be continued for a considerable time, the different kinds of gestation, even after the patient has recovered a moderate degree of strength, are often found preferable to those exercises, in which the body is moved by its own powers.

The gentlest kind of gestation is sailing, which is serviceable in almost all cases of debility, and has been found particularly so in debility of the stomach and bowels. Next to sailing, the gentlest exercise in common use, is the motion of a carriage; but in such climates as our own, unless the patient has been accustomed to an open carriage, he must either be confined to a close one, or run the risk of taking cold. As substitutes for a carriage, but inferior to it, swings and spring-chairs are used.

None of these modes of exercise is equal to horseback, when

the patient is strong enough not to be soon fatigued by it. From the stimulus given to the alimentary canal by the shaking in riding, it appears to be particularly well adapted to Indigestion; and every physician has seen instances of this disease, in which it has been more beneficial than any other exercise.

Any rough exercise, however, particularly riding on horseback, soon after meals, disturbs the stomach. If the reader will reflect on what has been said of the process of digestion, the cause of this will readily appear. We have seen that, in healthy digestion, no admixture of the new food, with that which may yet remain in the stomach from the last meal, and which, if due time have been afforded, has already undergone the action of the gastric fluid, nor indeed of the different parts of the new food, ever takes place. We must, therefore, infer, any such admixture is unfavourable to this process; and it is evident, from the way in which digestion is performed, that, did this happen, some part of the food would again be presented to the surface of the stomach, after it had undergone the digestive process, and, consequently, a corresponding portion of undigested food prevented from approaching it in due time.

The mixing of the different parts of the food by any jolting exercise will be most apt to take place in the dyspeptic. If we fill a closed vessel with such contents as those of the stomach, we shall find that but little relative change of place will happen among its different parts by shaking the vessel. But if, instead of these contents wholly filling the vessel, any space be occupied by air, their relative situation will be readily disturbed. Now, the stomach always, more or less firmly, embraces its contents; but, in Indigestion, air is generally extricated from the food, and we have reason to believe, indeed, is often secreted by the surface both of the stomach and bowels, and thus room is given for a ready change in the relative position of their contents. The dyspeptic is often warned against any jolting exercise after meals, by the uneasiness it occasions. It is a good general rule, therefore, for him to avoid exercise of all kinds for an hour and a half after eating. This affords an additional reason for not eating too

often. We still find the dictates of nature pointing out what is best; for all animals are inclined to repose, and even to sleep, after eating.

Walking, when it can be borne for an hour or two without fatigue, is, of all exercises, the best. It is that which nature intends for us. There is no other accompanied with such a uniform and regular exercise of the muscles and joints; and from the valvular structure of the veins of the extremities, it is better fitted than any other to promote the circulation, and consequently all the functions of the system. It is also the most agreeable mode of exercise. Our desire for it when it has been long withheld, becomes excessive.

But in Indigestion, from the peculiar effect on the abdominal viscera of riding on horseback, it is generally of service to combine it with this exercise. I have known some dyspeptics, however, to whom horseback was always more or less irksome, when it occasioned any degree of shaking. To such, the slowest riding alone can be useful, and that only when they are unable to walk for a sufficient length of time, and when the weather admits of such gentle exercise without a risk of being chilled, to which we have seen they are peculiarly liable.

Those exercises in the open air, in which the bodily exercise is combined with a moderate and pleasurable exercise of mind, particularly gardening, are well adapted to this disease, provided the patient can avoid fatigue, which is not always easily done when the mind is occupied.

A proper exercise of the mind, indeed, is almost of as much consequence to the dyspeptic as that of the body. When the latter is debilitated and ill at ease, the former is generally languid and listless. This state of mind is more or less counteracted by a due degree of bodily exercise, but the occupation of the mind itself is necessary to its cure.

The maxims by which the exercise of the body is regulated, are also applicable to that of the mind. The great rule is, to exercise without fatiguing it. Any study which fatigues, is injurious, and a mind wholly unoccupied is no less so. When the

debility is considerable, the mind should be occupied by amusement alone, and even those amusements which greatly interest the feelings, or occasion any considerable effort of mind, are hurtful. When, on the other hand, the patient has recovered a considerable degree of strength, a moderate attention even to business is serviceable. However varied our occupations, if they tend only to present gratification, they soon become insipid. The mind must have something in view, some plan of increasing its enjoyments, to interest it agreeably for any length of time. There are few things of greater advantage than the conversation of friends, who constantly present to the patient the fairest side of his future prospects.

The time of day, at which either the mind or body is exercised, is also a matter of importance. Towards evening every kind of exertion becomes irksome, and consequently hurtful. In the debilitated, a degree of fever, or something resembling it, probably the consequence of the unavoidable irritations of the day, comes on at this time, which is only to be relieved by repose: going early to bed, therefore, is of great consequence to them. It seems to be for the same reason that animal food is hurtful at a late hour.

Exposure to the night air appears to be more pernicious than we can easily account for. I am inclined to ascribe its effects to the damp which prevails in the early part of the night from the condensation of the watery vapour raised during the day, being applied to the skin, at a time when, from the state just mentioned, its function is most apt to fail. In sultry climates, where the evening dews are heavy, the effects of the night air are often fatal, even to those in health. It is well known, both in the East and West Indies, that people are often attacked with agues from passing a single night abroad in the woods, where the vapour is most confined. Of the baneful effects of the night air at Batavia, Dr. Lind relates a striking proof in his account of the fevers of India: " During the sickly season, a boat belonging to the Medway man-of-war, which attended on shore every night to bring

fresh provisions, was three times successively manned; not one of her crews having survived that service."

The bad effects of the night air, even of this country, to invalids, I had often remarked, before I began to consider to what it might be ascribed. Whatever may be said of the above explanation, which it would be difficult to verify,—of the fact I have no doubt. It may be observed, that the effects experienced from the night air by dyspeptics, are similar to those produced on them by a damp air from other causes.

It is chiefly to the greater dampness of the air of large towns, I believe, that we should ascribe their often disagreeing with dyspeptics. Dr. Hutton has shown, that when two portions of air, of different temperatures, saturated with water, are mixed, the mean temperature will not enable them to hold in solution the same quantity of water. I have, from an eminence, observed a wind, highly charged with moisture, passing over a great extent of country, which contained several small towns, and occasioning a deposition of moisture, wherever it mixed with the air of the towns; so that from each of them a streak of mist extended in the direction of the wind, the air every where else remaining perfectly clear. To the same cause we must ascribe the thick fogs of London. They occur when the air is most charged with moisture, and in cold weather, when the number of fires being greatest, there is the greatest difference of temperature between the air of the country and that of the metropolis. A damp air feels colder than a dry one of the same temperature, not only because it abstracts the heat of our bodies more rapidly, but because it tends to debilitate the functions of the nerves of the surface.

Although it is of consequence for the debilitated to go early to bed, there are few things more hurtful than remaining in it too long. After the degree of strength, of which the state of the system is capable, is restored by sleep, any longer continuance in bed, unless the debility be such as to render the mere effort of sitting up too much, tends only to relax. Getting up an hour or two earlier, often gives a degree of vigour which nothing else can

procure. I have known people whose feet constantly became cold and damp if they remained in bed a few hours longer than usual. For those who are not much debilitated, and sleep well, the best rule is to get out of bed soon after waking in the morning. This, at first, may be too early, for the debilitated require more sleep than the healthy; but rising early, will gradually prolong the sleep on the succeeding night, till the quantity which the patient enjoys is equal to his demand for it.

Lying late is not only hurtful by the relaxation it occasions, but also by occupying that time of the day at which exercise is most beneficial.

If the dyspeptic be much debilitated, he should take his first meal as soon as he is dressed. He will often find himself hurt, and always less benefited by exercise, either of mind or body, with the stomach and upper bowels empty, as they necessarily are, in the morning.

When the debility is less, he will often experience benefit from a walk or ride before breakfast. This observation is particularly applicable to those in whom Indigestion has produced too great a determination of blood to the head, which is, for the time, increased by the recumbent posture during the night.

We are most vigorous when the first process of digestion is so far advanced, that the vessels which receive the nutriment from the intestines are pouring it into the blood; and then it is that a free circulation is most useful for mixing the new juices with this fluid, and promoting its passage through the lungs, where they are perfected into blood.

Some light and agreeable occupation of the mind, with perfect rest of body, is best for an hour and a half after breakfast. From this period to the time of the second meal, which should be about the middle hour between breakfast and bed-time, is the proper one for all the more powerful exercises either of mind or body. The corresponding interval between the second and third meal, is better spent in the gentler employments of both; and after the last meal, which should be light, the invalid can hardly go to bed too soon.

The objection to going to bed after too full a meal is, that the sleep will be disturbed, and consequently less refreshing. Going to bed immediately, even after a light meal, in those unaccustomed to it, will have some degree of this effect, at first, but this inconvenience will soon cease. However artificial our habits may be, the system is generally soon reconciled to a return to what is natural. When four meals in the day are necessary, the interval between the first and the last should be divided into three, instead of two equal parts.

Under all circumstances of course, in regulating both diet and exercise, attention must be paid to the age and habits of the patient. It is seldom proper all at once to attempt the correction of the most injurious habits; the change should be made with caution and judgment. This is particularly the case with respect to the use of fermented liquors and active exercise, because there are no means that more essentially influence the constitution; and were we suddenly to withdraw the accustomed stimulants, or urge to efforts beyond the strength, irreparable injury might be done. The more advanced the age, habits are corrected with the greater difficulty, both because all habits are strengthened by continuance, and because the less vigorous the constitution is, it is the less able to bear the change.

At advanced periods of life, a change of habits must not only be attempted more cautiously, but it must not be attempted in the same degree. It is to be recollected, that in old age repose is more necessary, and exertions of every kind less beneficial and more apt to be injurious; and that powerful stimulants are less hurtful, both because old age requires excitements more, and there is less space left for them to produce their pernicious effects. Under all circumstances, however, and at all times of life, the principles which have been laid down must, I believe, be kept in view.

Such are the means of preventing the re-application of the causes of Indigestion most apt to arise from the disease itself. Some others will occur to the mind of every one conversant with the disease. Frequent vomiting, diarrhœa, and fits of constipation, are among the chief of these. It is almost unnecessary to say that they must be corrected as soon as the circumstances of

the case admit of it. The means proper for these purposes will appear in considering what may be called the medicinal part of the treatment.

Of the Medicinal Treatment in the first stage of Indigestion.

It appears, from what has been said of the nature of the first stage of Indigestion, that it arises from the debility of the muscular fibres and nervous influence of the stomach and bowels. While we are, by a proper regulation of diet and exercise, endeavouring to prevent every cause which may increase their debility, it is necessary, by the aids which medicine affords, to endeavour more directly to restore their vigour.

The medicinal treatment of this stage may be divided into that indicated while the disease is confined to the stomach and bowels, and that which becomes necessary in consequence of its having spread to other parts.

But, besides the means which alone deserve the name of curative, others to be regarded as preparatory, must occasionally be employed. To give the curative plan the best chance of success, it is not only necessary to remove the remote causes and prevent their re-application; but, as far as we can, to remove the more immediate effects of these causes, and thus bring the digestive organs into the circumstances most favourable to the operation of that plan.

Of the Preparative Means.

When we are consulted by those labouring under Indigestion, we generally find the stomach and bowels loaded. It is necessary in the first place, to relieve them from some part of this load, and, as far as we can, to correct the properties of that which remains. On this account we frequently find it advisable to commence the treatment by an emetic, followed by some mild aperient. It should be our endeavour, by an attention to the proper

rules of diet, to prevent the necessity of repeating the former of these; and the latter, we shall find, only makes part of the general plan, as far as it is necessary for the regular and free action of the bowels.

An emetic, in the early stages of the disease, seems sometimes beneficial by the excitement, as well as the evacuation, it occasions. Its frequent repetition, however, is injurious. Frequent vomiting, we have seen, ranked among the causes of the disease; yet the temporary relief, obtained by emetics, not only often induces the patient to repeat them, but has persuaded some physicians, that the cure of the disease may be attempted by them alone.

If the first emetic, however, does not remove it, as sometimes happens when it is slight, and of recent occurrence, rather deserving the name of disordered stomach than the disease we are considering, its repetition generally does more harm than good. If emetics are repeated at all, it should only be for the purpose of removing urgent symptoms. Their continued use not only occasions a great degree of morbid excitement, but inverts the natural action of the stomach, and frequently of the first intestine also, and consequently tends to debilitate both, and break the habit of their natural functions.

When it appears that offensive matter still exists in the stomach and bowels, after the operation of the emetic and aperient, which may be known by a sense of oppression and distention of these cavities, and by eructation of wind and ill-digested food, or of an acid matter, which is sometimes so acrid as almost to excoriate the fauces, we must, by gentle stimulants, particularly the distilled waters occasionally mixed with a small proportion of some aromatic tincture, endeavour to excite them to a better secretion; and at the same time, by the use of correctives, more directly to alter the morbid properties of their contents.

When the eructations are acid, the alkalis, magnesia, lime-water, and prepared chalk, are the best correctives. If the foregoing symptoms are attended with much debility, a cold surface, and sense of sinking, carbonate of ammonia is the best. When

the bowels are too languid, magnesia, which forms an aperient salt, with the acid of the first passages, may be used; and when diarrhœa prevails, lime-water, and the prepared chalk, which are astringents. In this case also, combining the chalk with some mucilaginous substance, which defends the surface of the stomach and bowels, as in the mistura cretæ, is generally of use. When none of the latter symptoms prevail, the fixed alkalis, particularly soda, from its greater power, is the best antacid.

Although morbid acidity may be lessened, it can not be wholly prevented by a diet consisting chiefly of animal food; and I have repeatedly had occasion to observe, that when a person is wholly confined to animal food, the contents of the stomach and the breath become very acid as soon as he begins to feel disgusted with it.

As the pains, which arise from irritating matter in the stomach and bowels, proceed either directly from irritation of their surface, or from spasms excited by the irritation, they are generally allayed by the means just pointed out. In the latter case, which is distinguished by the severity and intermitting nature of the pain, unaccompanied by the symptoms which indicate inflammation, the aromatic tinctures may occasionally be used in larger doses than would be proper in their habitual employment.

If the foregoing means fail, an opiate must be given, care being taken by the subsequent exhibition of an aperient, to counteract its constipating tendency. The exhibition of the aperient with the opiate tends to prevent the effect of the latter.

Spasm of a more permanent nature seems sometimes to attend and oppose a powerful obstacle to the action of the bowels. In such cases the combination of an opiate with the aperient, seems often to promote its operation. The repetition of the opiate, under such circumstances, however, requires great circumspection. It may, by counteracting the peristaltic motion of the intestines, prove a more obstinate cause of constipation than the spasm which it removes.

When the diarrhœa, excited by the irritating contents of the bowels, continues after we have reason to believe that its cause

has been expelled, mucilage of acacia, with small doses of opium, or if these alone do not succeed, combined with astringents, are the proper means.

When vomiting is obstinate, it is often allayed by the saline draught taken in a state of effervescence, or a mixture of sulphuric acid, conserve of roses, and peppermint-water, carefully strained. If these fail, the most effectual means, according to my experience, is a pill, composed of opium and camphor, and blistering the region of the stomach.*

Such are the means, by a judicious employment of which the stomach and bowels are brought, as nearly as their debilitated functions admit of, into the natural state; the more nearly this can be done, the better is the chance of relief from the means we are now to consider, namely, those which more directly tend to restore tone to the stomach and bowels.

Of the Treatment when the Disease is confined to the Stomach and Bowels.

We have seen that, although the causes of Indigestion seem, some to act on the muscular fibres of the stomach, and some on its nerves, yet these powers are so connected in their functions, that whatever debilitates the one, in a greater or less degree, necessarily affects the other. We shall find that a similar observation applies to the means of relief. Whatever tends to restore a healthy nervous power to the stomach, tends to form the food into that substance which is best fitted to excite the muscular fibres of this organ; and whatever excites the natural action of these fibres, tends to relieve the nerves from their load, and in the most

* When, in the second stage of Indigestion, along with the vomiting there is considerable tenderness on pressure in the epigastrium, the means which take off the inflammatory action, particularly loss of blood from the part, with subsequent blistering, are the most effectual.

In the affection of the stomach, called the water-brash, there is a frequent rejection, rather resembling eructation than vomiting, of a watery fluid from the stomach. I cannot help agreeing in opinion with Dr. Cullen, that this is a peculiar affection of the stomach, not depending on the state of that organ which produces the disease we are considering. It is not necessarily accompanied by the symptoms of Indigestion.

favourable way, to bring into contact with their extremities the food on which, through the intervention of the gastric fluid, their powers are to be exerted.

Although some of the remedies seem to operate more in the one of these ways than in the other, as I wish to avoid nice distinctions, it will be better to include the whole under one head, in an inquiry respecting the use of tonic remedies in this disease; and I shall attempt no other division than the simple one of the means which act directly on the stomach and bowels, and those which influence them through other parts.

The former may be divided into two classes, those which tend to excite, for the time, the particular function of these organs, or allay the irritation of their nerves; and those which seem to act less by any immediate effect, than by bestowing on them some degree of permanent vigour.

The medicines of one class have been termed stimulants and anodynes. The most powerful of the other consist of bitters, astringents, and those medicines which tend to support a due activity of the bowels.

I have already had occasion to observe, that simple distilled spirits, and still more the aromatic tinctures, tend for the time to promote the action of the stomach; and to warn against too free a use of them; because the increased vigour thus procured, especially if they have been frequently repeated, is generally succeeded by corresponding debility. By very small doses of such medicines, however, particularly when combined with those whose effects are more permanent, advantage on the whole arises. We find that bitters and astringents not only produced their good effects more speedily, but, for the most part, more permanently also, if combined with small doses of those medicines, which are more purely stimulant; and, indeed, the action of the latter seems often necessary to enable the stomach to bear the former without oppression.

Thus it has become an universal practice to combine a small quantity of distilled spirits and aromatics, with other stomachic

medicines. The quantity of distilled spirits in such mixtures should always be small, a twelfth, at most an eighth, of the whole. The choice of the aromatic is of less consequence; the properties of all are similar. Some suit the stomach and the taste of individuals better than others. There is, upon the whole, however, some difference in their properties. Ginger may be used when cardamoms would heat too much, and cardamoms will relieve flatulence and spasmodic pains, when ginger would fail.

Similar in their operation to this class of medicines are, ammonia and its carbonate, which have not, perhaps, obtained all the attention they deserve in this disease. They are more apt to heat than aromatics, and, in the same proportion, more beneficial in that languor and coldness, which are often such prominent features of Indigestion. Their greater tendency to heat seems to arise from their acting as a more general stimulant. They are more apt to strengthen and quicken the pulse, and, probably, act on the sanguiferous system after they are taken up by the absorbents; I have found them decidedly serviceable when aromatics had failed. They are best adapted to those cases where a continuance of the disease has produced much debility, and consequent languid circulation, without much tenderness of the epigastrium, or hard pulse, or any sensation of burning in the hands or feet at night.

Camphor possesses some of the properties of ammonia in a slighter degree. Its sedative property renders the mistura camphoræ a good vehicle for other medicines.

Among the means of temporary relief in Indigestion, very warm water holds a higher place perhaps than is generally supposed. To its frequent use we have seen there are the same objections as to other powerful stimulants. It deserves mentioning, although it is difficult to explan it, that a considerable degree of heat, I mean nearly as much as the patient can bear without complaint, applied externally to the region of the stomach, is more effectual, provided it be continued for a sufficient length of time, in relieving that kind of pain of the stomach which most frequently attends Indigestion, than any application of heat we can make

internally. It is also frequently relieved by heat applied to the feet.

Opium belongs to the head of remedies employed for temporary relief. Large doses of this medicine have no place in the treatment of Indigestion, except for the purpose of relieving severe pain. The other symptoms are increased by them. Very small doses, however, two or three minums of tincture of opium for example, repeated two or three times a day, often prove highly serviceable in allaying morbid irritation, and their constipating effect is generally easily counteracted. They sometimes indeed have very little of this effect.

I have found the pulvis ipecacuanhæ compositus the most beneficial form in which small doses of opium can be given in this disease. From two to four grains of this preparation, given every six or eight hours, appear to have a peculiar effect in allaying the irritations attending Indigestion, which probably arises from its action on the skin. It appears to be best adapted to those cases in which that combination of languor and restlessness, often so remarkable in this disease, prevails. It is better from time to time to discontinue and renew its use, than to exhibit it for a great length of time, without interruption; which, even when the dose is very small, is apt to occasion confusion or other uneasiness of the head.

The effect of opiates in Indigestion explains an observation sometimes made by dyspeptics, that they find their dinner digested with less flatulence and acidity, when they go to sleep after it. The composure produced by sleep, in some degree, answers the purpose of the opiate. In many dyspeptics a small dose of opium, taken after dinner, gives more relief, and, for the time, more effectually promotes digestion, than any other means. It is almost unnecessary to add, that the habit of having recourse to it for this purpose would be very objectionable. It is probably on account of its anodyne quality, that lettuce, as I have had occasion to observe above, appears to be less indigestible than other raw vegetables.

In considering the causes of Indigestion, we have seen how

readily the disease is increased by every thing which occasions morbid irritation of the nerves of the stomach. It is, in a great degree, in this way that the undigested contents of a weak stomach aggravate the symptoms. By lessening the sensibility of the nerves, and thus allaying that irritation, an opiate seems to check the progress of Indigestion, as well as to render us less sensible to the irritating matter already formed.

The medicines called nervous are also often useful in allaying irritation of the nerves in Indigestion, especially when it chiefly affects parts at a distance from the stomach. Myrrh, camphor, castor, and valerian, I have found most beneficial, except when the disease inclines to hysteria, and then a combination of some of these, and asafœtida, is a means of temporary relief, second, perhaps, to none but ether, which approaches too nearly to the nature of distilled spirits, to admit of its free and frequent employment. This class of medicines, and particularly the combination just mentioned, that especially of asafœtida and castor, seldom fail to give relief in palpitation arising from Indigestion, if no inflammatory disposition have supervened. It also, in general, gives more or less temporary relief to the dyspnœa, which we have found sometimes so obstinate a symptom of this disease. Of the various medicines of this class, however, those best suited to some cases are not always most effectual in others; and when such as are on the whole most successful fail, others often succeed.

But it is of much less consequence to give relief in fits of Indigestion than to prevent their recurrence. We are now to inquire how far medicine can assist the due regulation of diet and exercise in effecting this object.

The small doses of opium which I have just had occasion to mention, are calculated to effect more than temporary relief in Indigestion. I have found them, or rather still smaller doses, one or two grains, for example, of the pulvis ipecacuanhæ compositus, of essential use, combined with the medicines we are about to consider.

It has already been observed, that of the tonics whose effect is

most permanent, bitters and astringents are those on which we chiefly rely, and that their effect is increased by combining them with small doses of some of the stimulants we have been considering.

Bitters have been long known to possess a power of invigorating the digestive organs. There is a great variety of them, but I believe they may all be divided into simple bitters, and those which at the same time possess a stimulating quality. Of those in common use, camomile, bitter orange-peel, and wormwood, seem to be the most free from this quality*. Columba possesses it in a greater degree than gentian and cascarilla, and the Peruvian bark in a greater degree than any other. I speak not at present of the astringency of the last, which renders it a medicine of different properties. It is particularly to be observed that the stimulant property of bitters, although less immediately powerful, is of a more permanent nature than that of the stimulants which we have been considering; and the latter may often be used for the purpose of occasional relief, when the inflammatory tendency is too great to admit of the more permanent stimulant.

All the foregoing bitters, if we except the bark, which is often oppressive to the stomach, are well suited to the first stage of Indigestion; but in proportion as the second stage approaches, we find the less stimulating bitters answer better; and in this stage, even the gentian, which, of those that deserve the name of stimulating, possesses, perhaps, the least of this property, is often too heating, and the bark in general can not be borne, even for a few days; while in the earliest periods of the disease, when it supervenes on debilitated states of the constitution, and the stomach still retains considerable comparative vigour, a cold infusion of the bark is often the most beneficial of all bitters. It has by many been banished from the treatment of Indigestion, but this,

* By stimulating quality of bitters, I mean the power by which some of them increase the force of the circulation, and consequently are rendered improper where the inflammatory diathesis prevails. It seems not to be generally known, that this property bears little relation to the quantity of essential oil which they contain.

I believe, has arisen from its having been employed indiscriminately in all cases and periods of the disease.

It is remarkable that certain stomachs can not bear any species of bitter. I have known some who constantly suffer from even a few spoonfuls of camomile tea; so that in them we are wholly precluded from the use of this class of medicines.

Many object to the long continued use of bitters and aromatics. There are strong objections to the long-continued use of every medicine. If it is one of great power, it exhausts the strength; if not, it seems to become almost wholly inert. When the disease is obstinate, it is better, after a certain degree of relief is obtained, to discontinue such medicines, and, sooner or later, recur to them, as the symptoms may require.

I believe, however, the apprehensions from their long-continued use have chiefly arisen from their effects in gouty cases. It prevents the regular returns of this disease, as has been proved by the effects of what was called the Portland Powder, and some other specifics: but it appears, I think, from the facts stated in the last chapter, that the bad effects which ensue should rather be ascribed to the prevention of the regular gout, than any direct operation of the medicine. The same effects follow, when the return of regular fits is prevented merely by applications to the joints, which we know, independently of this consequence, could have no serious effect.

Astringents are less generally adapted to cases of Indigestion than bitters, on account of their tendency to increase the inactivity of the bowels, which so generally prevails in this disease. Some of them, however, are medicines of such value, that we often find it advisable to employ them, although at the expense of correcting this effect. Nor are they in all cases equally apt to produce it.

All vegetable astringents seem to have more or less tonic effect on the stomach, as well as on other parts of the system; and to this we must, in some degree, ascribe the good effects of the bark in the cases above pointed out; but the mineral kingdom affords the most beneficial medicines of this description. Of these, iron deserves the first place. In chlorotic Indigestion, combined with

stimulants, it is the most powerful medicine we possess, because it is the most powerful in removing the obstruction whence the Indigestion by sympathy arises, so that in this case it belongs rather to the class of remedies which we are next to consider; but there are few cases of Indigestion in which it is not found more or less useful at an early period, if no tendency to the second stage of the disease has shown itself. Its good effects are increased by combining it with bitters and aromatics; and, in idiopathic Indigestion, the carbonate has appeared to me its best preparation, provided it can be taken in rather large doses, without oppressing the stomach.

Next to iron, the sulphuric acid seems to be the best stomachic astringent, and it may be used in later stages of the disease than iron. It is particularly serviceable in those cases, where sweating, which is not unusual, is too easily induced by exercise; for much tendency to sweating indicates relaxation, not vigour of the skin. It appears from the experiments relating to the circumstances which influence the state of the urine, above referred to, that the saline matter, secreted by the skin, is not so certainly thrown off, even by profuse sweating, as by a free insensible perspiration.

In the opinion of many, the sulphate of zinc, given in very small doses, also holds a distinguished place among the astringents suited to Indigestion. It may be given at later periods than iron, but it requires caution; and if its good effects do not soon appear, should be laid aside. It is one of those powerful agents, which must always be employed with some degree of suspicion.

Other medicines beside bitters and astringents, seem to act in a similar way on the alimentary canal. All the mineral acids possess more or less of a tonic power. The white oxide of bismuth has lately been much celebrated. It seems best adapted to those cases in which there is frequent recurrence of pain referred to the stomach.

To enumerate all the medicines which have been employed with a view to restore vigour to the stomach and bowels would be a difficult task, and not a very useful one; for few, with the excep-

tion of the foregoing, possess much power. The acrid vegetables, particularly horse radish and mustard-seed, are indicated in the same cases in which ammonia and aromatics are most beneficial. Their infusion often forms a good vehicle for ammonia and its carbonate.

Sarsaparilla appears to me to hold a much higher place among the remedies of this disease than is generally supposed, but it is not to its early stages that it is best suited, and from its mucilaginous property, it is apt to oppress the stomach. It is in protracted cases, where general languor of the secreting surfaces has become permanent, and the stomach is consequently in some degree relieved, that it is most useful. I shall have occasion to make some observations upon it in speaking of such cases.

It has become common to employ mercury in some form or other in all cases of Indigestion; but, I believe its use is always injurious in the period of the disease we are now considering; that is, while the derangement is confined to the alimentary canal. I shall have occasion to treat fully of what appears to me the proper use of this medicine in the other stages of the disease. Instances have frequently occurred, in which the disease seemed to be confirmed by its unnecessary and improper employment. I believe we may say, without hesitation, that it is never to be used in any stage for the mere purposes of an aperient.

The proper use of aperients is a subject of great importance at all periods, and in all states of Indigestion. In the period under consideration, their object is merely to support a regular action of the bowels, which as the secretions of the whole canal are inclined to fail, and the stomach and upper bowels do not discharge their contents so readily as they ought to do, should be rather freer than in health. It often has an excellent effect to combine bitters with gentle aperients in the early stages of the disease. Epsom salts are frequently employed in this way with great advantage. If they are too cold, or occasion too watery a discharge, small doses of sulphate of potash and rhubarb often answer better.

Different aperients suit different constitutions. I have found

none employed merely for the purpose of supporting a regular action of the bowels, so generally as pills composed of ipecacuanha, compound extract of colocynth, and soap, with the addition of a little gamboge, when they are not sufficiently active, occasionally taken at bed-time. In many senna has appeared to me a medicine of great value. It seems more directly to promote digestion, at the same time that it excites the bowels; a property also of the pills just mentioned.

With respect to those remedies which act on other parts, and only by sympathy influence the alimentary canal, the most powerful and, indeed, the only ones which appear to have much effect, are such as make their impression on the uterus and the skin. I have already had occasion to mention one of the most powerful of the means tending to restore the functions of the uterus. All this class of course are beneficial in Indigestion, as far as it depends on a failure of those functions. With respect to the means which make their impression on the skin, the cold bath, where there is considerable general vigour, and the warm salt bath in almost all cases, the shower bath, particularly where there is too much determination of the blood to the head, and spunging the body with salt water, or water and vinegar, especially when this practice is followed by friction of some continuance, often aid other means, and sometimes appear to be powerful remedies. Among these means might also be ranked blistering the epigastric region, were not so severe a remedy hardly allowable in the earlier periods of the disease, where gentler means generally succeed. Covering the epigastric region with stimulating and anodyne plasters is sometimes of use.

The gastric fluid of other animals has been proposed as a remedy in Indigestion. If the view which has been taken of this disease be correct, it could answer no other purpose but that of temporary relief. I have known the inspissated bile of the ox used as a cathartic in Indigestion with good effect. It appears to deserve attention, particularly in the state of the disease we are now to consider.

Of the Treatment when the Disease has spread further than the Stomach and Bowels.

It is observed in the first chapter, that, sooner or later after the first symptoms of this disease have shown themselves, the alvine discharge begins to deviate from the healthy state, in different cases, and sometimes in the same case at different times, assuming various appearances. The treatment then becomes more complicated.

When the alvine discharge assumes an unnatural colour, we may be assured that the disease has spread further than the alimentary canal. The secreting power of the liver, and, probably of the pancreas, partakes of it. As these organs pour their secretions into the first intestine, the state of which seems greatly to influence the symptoms of the different stages of Indigestion they immediately affect the greater part of the canal, and, by sympathy greatly influence the state of the stomach. From the size, structure, and position of the duodenum, it is evidently the intention of nature to detain its contents for some time, that they may be intimately mixed with those secretions; and we have reason to believe, that the process which takes place in this intestine, is essential to the due formation of chyle. The beneficial effect of purgatives in Indigestion seems greatly to depend on their assisting its motions. It appears, from the enumeration of the symptoms, that they are much influenced by the state of the duodenum; and I have, from several cases, had reason to believe, that the peculiarly beneficial effects which I have witnessed from the senna in Indigestion, arise from its being well fitted to promote the action of this intestine. It has appeared more effectually to remove the fulness of the right hypochondrium, when it depends on morbid distention of the duodenum, than any other medicine equally mild in its operation.

The change in the appearance of the alvine discharge, we have seen, occurs at various periods of the disease; in some cases, almost as soon as the symptoms of Indigestion begin to attract

notice; so that it is difficult to say, except from considering the nature of the remote causes, where the disease originated. It is more common, however, for it to take place after various symptoms of disordered digestion have lasted for some weeks, and the slighter symptoms, we have seen, may continue for years without any material alteration in the appearance of this discharge.

Of the particular state of the pancreatic fluid, we have no means of judging. The alvine discharge, it appears from what was said above, generally owes its colour to the bile. By the degree of colour, therefore, we may judge of the quantity of bile poured into the intestines, and by its hue, of the state of this fluid. An admixture of blood, when it flows from a high part of the canal, so that it is mixed with the other contents, and has had time to assume a dark colour, before it is discharged, sometimes gives to the discharge an appearance similar to that given by certain states of the bile. They may be distinguished, however, by dilution with water; if the change of colour arise from bile, a greenish or yellowish shade will be produced; if from blood, a dark brown one.

When the change in the alvine discharge takes place, then, we are assured, that in addition to the original disease, we have to contend with derangement in the function of the liver. The case is now not only more complicated, but more difficult of cure: the diseased action of parts which sympathize, while there is no degree of structural derangement tending to confirm each other.

The principle of the treatment is to combine with the means, which tend to restore vigour to the alimentary canal, which we have just been considering, those which correct the morbid state of the liver. It is generally admitted that we possess no medicine of equal power with mercury in correcting the morbid states of this organ, but it unfortunately happens that its continued use is generally injurious to other organs, and particularly to the stomach and bowels; and the chief object to be kept in view in its employment in this stage of Indigestion is, so to manage its exhibition, that it shall produce the desired effect on the liver, with as little injury as possible to other parts of the system.

The first observation which presents itself on the employment of mercury at this period of the disease is, that it is not to be so given as to be received into the circulating system. Mercury, when thus introduced, has the property of more or less exciting all the secreting surfaces, but their excitement is supported by it at great expense to the constitution, and when long continued, seldom fails to impair its powers. No practice can be worse than that which unnecessarily risks this effect. In the first stage of Indigestion, there is no occasion to change by such powerful means the state of the general habit to which the diseased action has but imperfectly extended, and in which it is still so purely sympathetic, that it immediately disappears as soon as the disease of the central parts is removed; and experience has amply proved, that the deranged action of the liver can, in consequence of the sympathy which exists between this organ and the alimentary canal, be corrected by the local effect alone of the mercury on the latter.

Another observation of importance respecting the use of mercury at this period is, that its long-continued use is seldom necessary. The practice of giving it every second day, or even daily, and almost indiscriminately, in cases of Indigestion for a considerable length of time without attending to the state of the alvine discharge, although its reception into the system be prevented by the regular use of purgatives, is, as far as I can judge, in opposition to every thing which we know of the nature of the disease, and the effects of this medicine.

What are the effects which we expect from the use of mercury, in the first stage of Indigestion after a healthy secretion of bile is restored, which is often effected by two or three doses, sometimes by one? It is true that a recurrence to it is generally necessary, but in the first instance we should wait till we see whether this necessity will be indicated by a return of the morbid state of the bile. The effect of its first exhibition is more or less permanent in different cases, and the most favourable cases, when we have obtained a healthy flow of bile, yield to the other means we have been considering.

In the more obstinate cases, indeed, where the disordered state of the liver constantly recurs at short intervals, it is better for a certain time to give a moderate dose at stated intervals, by which the alimentary canal will suffer less, as a smaller dose is required for the prevention of this state, than for its removal. But even in these cases, this practice should not be long pursued, without trying from time to time how far the powers of the constitution are sufficient without its aid. By these means we ascertain the extent to which it is necessary to carry the use of this medicine.

The form in which it should be exhibited is also a point of great importance. It ought never, we may safely affirm, in the case before us, to be used externally; for we have no reason to believe, that its action on the skin can materially affect the liver by sympathy; and we often find that, when exhibited in this way, it produces little effect on that organ, till the state of the gums shows its presence in the constitution, which I have already had occasion to observe, is at this period unnecessary.

All that is here wanted is something that may speedily correct the disordered function of the liver. To produce this effect quickly, without being more generally applied to the system than is necessary, mercury must be given internally. The sympathetic effect on the liver, during its passage through the alimentary canal, we have seen, is sufficient for the purpose.

There are two forms in which it is usually given, calomel and blue pill. The former being the most aperient, it is a good general rule to give it when the bowels are most languid, and the blue pill when they are more easily excited. But this is not the only property inwhich these preparations differ. The blue pill is generally most oppressive to the stomach; the calomel most irritating to the bowels; although in some cases, I have seen the former, in very delicate subjects, from its being less cathartic, and consequently, for a longer time, hanging about the bowels, if I may use the expression, more irritating than calomel.

For the same reason, small doses of calomel, a quarter, or half a grain, are often more irritating than two or three grains, which more quickly pass off; and the irritation of the bowels is most effect-

ually prevented by taking an opening draught some hours after the calomel. With most people, this is not necessary when the blue pill is taken, its continuance in the bowels generally giving less uneasiness.

From these properties of the two preparations, the reader will readily perceive the circumstances which should influence our choice of them. In the most recent cases, calomel taken at night, and carried off by an aperient draught in the morning, generally answers best. Here we want only the most transitory action of the medicine.

On the other hand, when the disease has lasted longer, or the first few doses of calomel have failed to produce a permanent flow of healthy bile, we feel the necessity of employing a preparation which may remain longer in the alimentary canal with less irritation than calomel would produce were it retained there.

Hence the great success which often attends giving four or five grains of the blue pill every second or third night, as recommended by Mr. Abernethy, particularly in those cases where the affection of the liver has supervened early, and where, consequently, it is the principal cause which supports and aggravates the disease. This observation, it is evident, applies with still greater force, when it is the original disease, and the alimentary canal suffers only by sympathy and the irritation of the vitiated secretion of the liver. It is always to be recollected, however, that in Indigestion it is an unhealthy secretion of bile alone which renders mercury necessary in the first stage, that the time in which it produces the necessary effect is different in different cases, and that all that is taken after this is injurious.

In some, the blue pill is so oppressive, that I have seen several who could not take it even in much smaller doses.* To them it

* It is remarkable that the blue pill is so offensive to some constitutions, that I have seen several instances, in which it disordered the secretion of bile, even when it was healthy at the time of its exhibition; and in such cases, as far as I have observed, the disordered state of the bile continues as long as it is used. This effect is similar to that which we sometimes observe from repeated doses of calomel in children.

is necessary to give small doses of calomel, and if it irritates, to combine it with anodynes.

It also deserves particular attention in the choice of these means, that the most beneficial use of calomel necessarily occasions brisk purging, on which the benefit derived from it often greatly depends; while, by its peculiar effect on the first passages, it excites a better action of the liver; by its purgative effect, as well as by that of the draught which its exhibition renders expedient, it tends further to emulge the gall-ducts, and relieve the distended state of the liver.

Its operation then is most wanted where this distention is greatest, which may be known, we have seen, by the state of the right hypochondrium, and will be least injurious where the strength is most able to bear so considerable a call upon it. When there is little distention of the liver, and the strength is much reduced, the operation of the blue pill, provided it agrees tolerably well with the stomach, is preferable. The relief obtained from it may be less speedy, but it will be obtained at less expense to the constitution. Instances frequently occur of the bad effects of not attending to this distinction. What is only a salutary evacuation in one case, is an overpowering cause of debility in another.

Where the symptoms are rather obstinate than severe, and where they yield readily, but continually show a tendency to return, covering the parts, to which the tenderness and fulness have extended, with a warm mercurial plaster, often, in the former instances, tends to remove the disease; and in the latter, to prevent its recurrence. I have known such a plaster worn for months, and even years, the symptoms constantly recurring when it was laid aside.

When mercury occasions much irritation of the bowels, its continued use brings on a degree of the dysentery. Calomel, we have seen, is most irritating; it is, therefore, most apt to produce this effect. The patient is tormented with griping and tenesmus, and at length passes little more than mucus, often mixed with a small quantity of blood. If in such cases, we increase the dose of mercury, in hopes of freer evacuations, we only increase the

evil. Discontinuing its use for a little is the best remedy; and when we find, as sometimes happens in such cases, that on returning to it the same symptoms constantly recur, and can not be prevented by changing the preparation, or the use of anodynes and mucilages, it must for the time be laid aside.

Both because mercury seldom produces the effect here mentioned, except when its use has been continued for some time, and because the effect is most apt to ensue when the bowels have been long exposed to other causes of irritation, we less frequently have to contend with it in the first stage of Indigestion, which is the more fortunate, because the few substitutes for this medicine, which we possess, are less suited to the early than the more advanced stages in which it appears. From what is said above, the disease is not only essentially altered in its nature, but affects the system more generally.

Some of the mineral acids are the best substitutes for mercury. A combination of the muriatic and nitric acids has appeared to me the most successful, whether taken internally or used externally in the way recommended by Dr. Scott.

This class of medicines are otherwise useful, we have seen, in the first stage of Indigestion; and if they maintain a due action of the liver, there is no occasion for the use of mercury. They seldom, however, have this effect for any length of time when its action has once been disordered; and they are much less calculated than mercury for quickly restoring it, and hardly at all for suddenly emulging the biliary ducts, the effects which we look for from mercury in the first stage of Indigestion. I shall have occasion to make some further observations on the use of the mineral acids, in speaking of the treatment of the second stage.

In some cases we shall find the dandelion an assistant to mercury, and under certain circumstances capable of being substituted for it. It is defective in the same respects as the acids, and has the additional disadvantage of often being oppressive to the stomach in considerable doses, and in small doses it is of little or no use.

From a want of attention to the circumstances under which

medicines should be employed, many fall into disrepute, which are capable of excellent effects when used more judiciously. We are too apt to fall into the practice of viewing a certain set of medicines as calculated to remove a certain disease, and, as one fails, to use another, without much attention to the properties peculiar to each, or the circumstances of the disease to which these peculiar properties are adapted. If we have recourse to the acids or the dandelion, wherever mercury does not afford the usual relief, we shall often be disappointed. If we employ them in the cases I shall soon have occasion to point out, they will seldom, as far as experience enables me to judge, fail to be useful.

The treatment of the first stage of Indigestion, then, consists in promoting the due action of the stomach and bowels, by the various means which have been detailed; and correcting the secretion of the liver, if it deviates from the healthy state, by the occasional use of mercury, care being taken neither to employ it in greater quantity, nor for a longer time, than is necessary for this purpose, as its effects on the stomach and bowels are evidently in opposition to the other parts of the treatment.

SECTION II.

Of the Treatment of the Second Stage of Indigestion.

It appears from what was said of the symptoms of Indigestion, that they are liable, after the disease has lasted some time, to undergo a considerable change; the epigastrium becoming tender on pressure, the pulse hard, and some tendency to fever supervening. These symptoms characterize what I have called the second stage of the disease.

The period at which this change happens, we have seen, is nearly as various as that at which the deranged function of the liver shows itself, which it sometimes accompanies from its first appearance, but hardly ever precedes. In most cases, the above symptoms do not supervene till the function of this organ has been disordered for some time, or its disordered state has repeat-

edly occurred. It may also be observed, that, like the disordered state of that function, they are apt to come and go for some time before they are established. This is true, even of the tenderness in the epigastrium. On one day it shall be considerable, and, even on the next, without the use of medicine, it shall have disappeared. In most cases, however, it is more stationary from the first, and, if the disease lasts, it always becomes so.

As soon as the symptoms characterizing the second stage are established, we find that bitters and aromatics cease to give any effectual relief; and in many cases, the most stimulating in particular, increase the feverish restlessness that occasionally assails the patient, and that languor and uneasiness which seldom wholly leave him. If, in consequence of his increasing complaints of debility, his medicines are changed for others of a more strengthening nature, the effects are still worse; and he often thinks that his disease admits of no relief, but from aperients and particularly mercurial aperients, of the good effects of which he is always sensible, and, consequently, is very apt to fall into an excessive use of them: and many medical men appear to have arrived at nearly the same conclusion, for it is not unusual to find them declaring, that they see little good done in such cases except by purgatives and mercurials, a principle which has sometimes been applied even to the earlier stages.

Unless I have been deceived by a pretty extensive experience of the phenomena of this disease, there is no stage of it to which this conclusion is applicable. We have seen that purgatives and mercurials, properly employed, are valuable medicines in the first stage. We shall also find them so in that we are about to consider. But in both they are only part of the means, and, if employed too freely, and to the neglect of others, will in all cases do mischief.

The inflammatory symptoms of the second stage of Indigestion, led me to adopt a practice founded on them, and the immediate relief obtained, confirmed the views which had suggested it.

The stimulating plan, which is proper while the fault is in the muscular and nervous powers of the stomach alone, is no longer

applicable. The disease, however, still so far partakes of its original nature, that, were we to regulate the treatment by an attention to the inflammatory symptoms alone, the powers of the system would soon sink under it

The more powerful anti-inflammatory measures, therefore, a very low diet, general blood-letting, &c., are rarely proper, unless, as sometimes happens, the inflammatory symptoms increase to those of active inflammation. The disease is then of a different nature, and must be treated on the same principles, although with more than usual caution, as other phlegmasiæ. The less stimulating of the tonic means employed in the first stage, on the other hand, are still indicated; the extent to which the one or other set of means should be carried, being regulated by the greater or less degree of the inflammatory tendency.

In two other respects, the principles of the treatment in the first and second stages of Indigestion differ. In the enumeration of their symptoms, we have seen, that although various other functions suffer more or less by sympathy with those of the digestive organs, almost from the commencement of the disease, it is in the second stage, both from the longer continuance of the derangement of the central parts, and from the greater severity and more complicated nature of that derangement, that they suffer most. Their affections, therefore, here influence the indications of cure more than in the first stage; and as the strength is more impaired in the second stage, while the means of relief, at the same time, are of a more debilitating nature, an uniform endeavour to preserve, as much as possible, that which remains, is here more indispensable. Evacuations, which, while the vigour of the system is comparatively entire, and the patient can be supported by stimulating diet and medicines, have the best effects; at a later period, and where less stimulating means alone are applicable, may be attended with serious injury. The system not rallying now, as in the first stage, the effect of one debilitating measure is still felt, when we are called upon for another; and, if our plans are not regulated with caution, and so directed as at no great distance of time to restore the proper

functions, and thus render a continuance of such measures unnecessary, the patient sinks equally under his disease and the means employed to relieve it.

Such then are the principles on which, as far as I am capable of judging from repeated experience of the various plans which have been pursued in this disease, the proper treatment of the second stage is founded. An inflammatory tendency is superadded to the derangements which constitute the first stage; stimulating measures are therefore to be employed with more caution, and anti-inflammatory measures become more or less necessary. The diseased action has spread farther, and the strength is more reduced; our measures must therefore embrace a wider field of practice, and the strength must be husbanded with greater care.

We are now to consider more in detail the means, to the employment of which these principles lead. I shall, in the first place, lay before the reader that part of the treatment, which forms the characteristic difference between it, and that we have been considering; and then point out how those means, which are common to both stages, should be modified in the one before us. We shall next consider such additional means as do not belong to the treatment of the first stage, but can not, like the anti-inflammatory means, be regarded as in opposition to the plans there pursued; and in the last place, take a view of the treatment of the sympathetic affections which attend the second stage, and require means directed to the organs they affect. These we have seen immediately lead to change of structure, and may, therefore, be regarded as the link, which connects the second and third stages of this varied disease.

The first thing, which appeared to me to throw much light on the nature and treatment of the second stage of Indigestion, was the effect of applying leeches to the tender part of the epigastrium. It was not, I found, merely that the tenderness was relieved, and the pulse softened; but that the patient breathed and walked better, that the bowels were more easily moved, and the skin appeared more relaxed, the feverish tendency which frequently shows itself in the evening, being in the same degree lessened.

From these observations it appeared, that the effect of the leeches was not that of mitigating any particular symptoms, but of relieving the cause of the whole; because it is only on this supposition that such general relief could be afforded.

But even these, I found, were not the whole effect of the local blood-letting. On resuming the plan of treatment, it soon appeared, that the patient bore the use of tonics much better than before; and in some instances, a recurrence to the treatment of the first stage, under such circumstances, removed the disease. It seemed to have been the slight inflammatory action, which the leeches relieved, that alone had prevented the beneficial effects of these means I have thus had many opportunities of seeing the patient, after the use of the leeches, quickly restored to health by a plan, little different from that which had previously been employed in vain, and sometimes with an aggravation of the symptoms.

But so fortunate an issue, I soon found, was only to be expected where the second stage had been of very short duration, or the constitution was particularly favourable. On the tonic plan being resumed, the tenderness of the epigastrium was generally soon renewed, and a repetition of leeches became necessary. Each repetition to the same extent generally produced less relief than the preceding, and if a larger quantity of blood was taken, the relief was obtained at too great an expense of strength.

The application of a blister to the part from which the blood was taken, immediately after its abstraction, tended both to increase the effect of the leeches, and render it more permanent; but, even with this aid, their repetition in the more inflammatory cases soon became necessary. In those less inflammatory, blisters sometimes relieved the symptoms without the aid of leeches, but like the leeches they often failed to give permanent relief.

Other measures, therefore, were requisite. The first that occurred was to abandon, in such cases, the more stimulating parts of the treatment, and although the patient generally felt a degree of sinking and debility from this change, particularly if made too suddenly, these symptoms were less permanent than when re-

peated bleedings were employed, and the constitution gradually accommodated itself to the change.

The lighter bitters and those stimulants whose effects are comparatively more exerted on the nervous than the sanguiferous system, could in general still be borne. Among many hundreds, I have seen but few who could not bear the occasional, though not the regular use of aromatics, or even of ammonia and some of its preparations; and all could take the infusion of camomile flowers or bitter orange-peel, with the exception of those whose peculiarity of constitution did not admit of the use of bitters at any time: and with regard to diet, although in the more confirmed cases few could bear well the most stimulating kinds of meat, particularly beef, a little chicken daily, or once in two days, was generally borne without inconvenience, and supported the strength more, and agreed better with the stomach, than a diet composed wholly of vegetable food.

Nor have I found it necessary in such cases wholly to abstain from the use of wine, although it has generally been advisable to lessen its quantity, and often to take it diluted. It is seldom, I believe, proper to reduce the diet more than this, unless active inflammation be threatened. In a few, particularly when a considerable degree of hardness of pulse, notwithstanding the use of the above means, continued, I have seen a diet wholly vegetable and even a total abstinence from wine, which is much less permanently stimulating than animal food, strikingly beneficial. It is common for the appetite to improve on lessening the quantity of animal food. This depends in part on other food affording a less proportion of nourishment, but very much, I believe, on the tendency to fever being lessened by the change.

The state of the bowels in such cases is often influenced by the diet in a very remarkable manner. They are not only torpid under the use of animal food, but purgatives act imperfectly, and with great irritation. On using a vegetable diet, they are frequently relaxed without the aid of medicine; and if purgatives are still necessary, they act in much smaller doses, and without irritation. It has generally been found better, however, to obvi-

ate the inflammatory tendency by other means, than to adopt so low a diet as very essentially to reduce the strength.

Of all the medicines which I have employed with this view, I have found none equal to nitrate of potash taken in a considerable quantity of water, in which a little gum had been dissolved. The gum seems by defending, in some degree, the stomach and bowels from the irritation of their contents, which tends to counteract the cooling property of the nitrate, to add sensibly to its effect. If much be added, however, it is apt to oppress the stomach. Eight or ten grains of nitre in an ounce and a half of water, with a twelfth or sixteenth part of mucilage of acacia, have been given three times a day, and repeated every hour or hour and half, when the skin became hot generally, or the hands and feet began to burn. Two or three doses thus taken seldom fail to reduce the increased temperature, and relieve the restlessness which it occasions; and thus simple as these means are, they often procure good nights, when the want of sleep, as frequently happens in this stage of the disease, is the effect of feverishness. The common saline draught, the sulphate of potash and other medicines of this description have similar effects, but none of them appear to me equal to the above nitrate.*

It is not to be overlooked, however, that all medicines of this description are debilitating. I have known injury done by two free a use of them, the powers of the stomach being farther enfeebled, and a state of greater general, nervous debility supervening. In general, it is only when they are used incautiously, that these effects are to be apprehended. I have met with a few, in whom even small doses of the nitrate of potash occasioned irritation and debility.

In addition to the foregoing means, rather a freer use of aperients than in the first stage has been found useful. Aperients not

* The carbonic acid gas, disengaged when the saline draught is taken in a state of effervescence, is grateful to many stomachs; to others it is oppressive, and the draught seems to agree better with the stomach when the effervescence has been allowed to subside. I may here observe, by the by, that both from the extraction of air being apt to oppress, and because they more readily combine with the acid of the first passages, the pure alcalis are sometimes found better correctors of acidity than their carbonates.

only promote the action of the bowels in expelling their contents, but occasion a freer flow into them of the bile and pancreatic fluid, and of the fluids of the various glands of the canal itself. We have also, indeed, reason to believe that they stimulate the absorbent, as well as excreting vessels, a languid state of the bowels being unfavourable to nutrition.

The disease, however, partakes too much of the chronic nature to admit of great evacuations of any kind; and, although the free action of the bowels is indicated here, not only as a means of exciting the various functions of the canal, but of allaying inflammatory action, I have seldom found more than three evacuations in the twenty-four hours proper; and even this degree of catharsis should not be continued for many days together, for although the call for it is greater than in the first stage, the strength is often less able to bear it. Constipation, on the other hand, should be very carefully avoided, both from the direct injury it does, and because it is difficult to remove it without means, which risk too great an effect. Purgatives, on the whole, can hardly be here regarded as among the means employed for the purpose of relieving inflammatory action. They must be used chiefly for the same purposes as in the first stage, and consequently belong rather to the means we are next to consider.

When the inflammatory symptoms continue to recur after the temporary relief obtained by the preceding means, a perpetual drain, established in the most tender part, is often followed with the best effects. I have seen many cases, with this aid, yield to the means which they had long resisted without it.

With regard to the modification, in the second stage, of the means common to both stages, in considering the anti-inflammatory measures suited to that stage, I have necessarily been led to make such observations on diet, aperients, and the use of stimulants and other tonics, as apply to it.

When the first stage of Indigestion, we have seen, has continued for some time, the function of the liver becomes disordered. A greater or less tendency to disorder in this organ, after it once appears, always continues throughout the disease, so that it is a

constant attendant on the second stage; and those medicines which influence the secretion of this organ, therefore, always form part of its treatment. Of these we still find mercury by far the most efficacious.

Several circumstances render caution, in the use of this medicine, even more necessary in the second than in the first stage. Not only has the greater continuance of the disease occasioned a greater loss of strength, but its increase and the change which has taken place in its nature, renders it necessary to employ this medicine for a longer time, and often in a way that more directly influences the state of the constitution.

In the first stage, we have seen, we want only the local effect of the medicine on the stomach and bowels; and in the earlier periods of the second stage, and in mild cases, even after the disease has continued for a long time, we still find that this effect of it, particularly of the blue pill, repeated for a longer time, is often sufficient, especially when the anti-inflammatory measures we have been considering are duly employed.

When it is sufficient, no other should be attempted. But in many cases, and in a large proportion of those of long standing, it fails. The relief afforded by the occasional doses of mercury gradually becomes less, and they at length cease to be of any essential use.

When it is given in such doses, indeed, as to produce a considerable effect upon the bowels, partial relief is still often obtained, but the strength rapidly fails under this employment of it; and the relief afforded does not extend to the most essential part of the disease. While the patient is relieved for the moment, we find the slow change which leads to the disorganization of some vital part going on, and constantly occasioning a renewal of the symptoms; which are thus relieved at an expense of strength, that accelerates the fatal termination; and, beneficial as occasional doses of mercury usually are in the earlier periods and milder forms of the disease, it may often be questioned whether in confirmed cases they do more good or harm.

Finding so little advantage from the usual mode of giving mer-

cury, in the second stage of Indigestion, when it does not soon show a tendency to yield, and that all means are so generally unsuccessful in the last stage, which, in such cases, is always at hand, it occurred to me to try the effect of more frequently repeated doses of this medicine, so small, that if they did little good, nothing, at least, was to be apprehended from them.

I have generally given a grain of the blue pill, sometimes only half a grain, twice or three times in twenty-four hours, till the secretion of bile appeared to be healthy, repeating these doses when it was again disordered; and by such doses, which may appear to many little better than trifling, I have seen the bile gradually restored to a healthy state, when larger doses had been employed in vain. They not only often succeed where larger doses fail, but the change, in proportion as it takes place more slowly, seems generally to be more permanent.

The correction of the state of the bile, however, is but one of the effects of such a plan. Along with its improvement, the skin generally becomes relaxed, and of a proper temperature, the pulse more dilated, the colour and expression of the countenance better; and, in particular, that expression of langour, so peculiar to the advanced stages of the disease, abates. As all these changes depend on a common cause, and consequently take place together, the state of the bile, which should from time to time be ascertained, is a good indication of the general effects of the medicine.

It is true that the most transitory effects of mercury, when they correct the state of the liver, at the same time produce many of the foregoing effects in other organs, the diseased state of which is supported by sympathy, with that of the alimentary canal. But this is chiefly observed in the first, or the milder cases of the second stage; while in the more serious cases, the affection of these organs, we have seen from its frequent recurrence and longer continuance, becoming more obstinate and less immediately dependent on the original disease, resists the occasional exhibition of the medicine.

On this the good effects of the plan, I am here considering, seem chiefly to depend. By the mercury being given in such

minute doses, it enters the system, and acts directly on the various organs, now too much implicated in the disease to yield to its sympathetic effect, yet, by the smallness of the quantity, it is unattended by the bad consequences of what is called a course of mercury.

The beneficial effects of this plan appearing slowly at first, discourages the hopes of the physician, and, as I know, in many instances, has caused it to be laid aside. It is difficult besides to persuade the patient that any plan which produces no immediate sensible effect, can be much relied on; for I have always made it a rule to discontinue the mercury even in this stage of the disease, when the slightest affection of the mouth appeared, and any degree of salivation has generally seemed to me to do more harm than good.

It is nearly twenty years since I first adopted this mode of using mercury in the case before us, and I have now great satisfaction in stating, that several men of experience, in our profession, who, at first, believing that no good could result from such minute doses, viewed the practice as little better than a waste of time, have since confessed, that it gave a degree of relief which could not be procured by larger doses. This, and my own repeated experience of its effects, enable me to speak of them with confidence.

Although we do not thus obtain the sudden benefit which results from a more vigorous practice, we avoid the mischief it often does; and whatever good effect is produced, is allowed, if I may use the expression, to accumulate in the constitution. We are not undoing on the one hand, what is done on the other, which, with all the care that can be taken, is very often the case when larger doses are employed.

It is almost unnecessary to observe, after what has been said, that to render the plan most successful, the various observations respecting diet and exercise, and the occasional aids of cathartics, local blood-letting, blisters and cooling medicines, must constantly be kept in view; and if the blue pill occasion any irritation of the bowels, which sometimes arises even from the doses here recommended, it must be obviated by anodynes.

For this purpose I have found the extract of poppies, conium, and hyoscyamus, the best means; and I have, for the last eight or ten years, been in the habit of combining equal quantities of the last of these with the blue pill, as a preventive; and have experienced from it not only this advantage, but some good from its general sedative effect on the system; and it will easily be believed, that the extract of hyoscyamus in doses not exceeding a grain, given two or three times a day, never produces inconvenience of any kind.

If the irritation, occasioned by the internal use of the mercury, can not be allayed, its external use may here be tried, the dose being proportioned to that recommended internally. From a scruple to half a drachm of the weak mercurial ointment may be rubbed into the skin every evening. This way of employing it, however, is objectionable in the case before us; by it the medicine is less effectually applied to the chief seat of the disease, and the quantity received is much less easily ascertained. I have already had occasion to observe, indeed, that the external use of mercury seldom has much effect in correcting the state of the bile, till it produces some effect on the mouth.

If even this use of it irritate the bowels, which may happen, particularly in the advanced stages, when they have already suffered much from the medicine, and we can not obviate that effect, it must be discontinued; and only renewed at intervals, for the time that the bowels can bear it without irritation. Beyond this even the smallest doses do more harm than good.

In the few constitutions, in which no dose of the blue pill can be taken without disordering the stomach, I have substituted for it, with good effect, a sixth or eighth part of a grain of calomel, combined with some anodyne, but this preparation is not so well suited to the objects in view.

It is not uncommon in all constitutions, for a few grains of the blue pill to occasion a slight pain referred to the stomach soon after it is taken, which continues for half an hour or more, and this symptom sometimes arises from smaller doses; but it is seldom of much importance, and often ceases to recur after a few doses have been taken.

I have not found it necessary to confine the patient under the foregoing plan, while his strength is equal to the exertion of going abroad; except at night and in bad weather; and this degree of confinement his disease requires independently of medicine.

I have had occasion to observe that it is to the second, rather than the first, stage, that the substitutes for mercury are best adapted, and that the mineral acids, particularly a combination of the muriatic and nitric acids, and the dandelion appears to be the best.

Much has of late been said of the external use of these acids. Both their internal and external use has appeared to me best adapted to cases of some continuance, where the inflammatory tendency has been to a great degree subdued, and small doses of mercury have been employed without the usual benefit. In such cases, I believe, the use of the acids will almost always be found better than increasing the quantity of mercury beyond what produces the slightest indication of its presence in the gums. If the habit bear the mercury well, the acid may be used in aid of it; if not, or if the use of the acid, as sometimes happens, causes the mercury to irritate the bowels, the latter should be discontinued under the use of the acid.

When the mercury, either on account of its effects on the bowels, or the debilitated state of the patient, can only be used at intervals, the intermediate use of the acids is generally of considerable service. They tend at once to restore the strength and prolong the effects of the mercury. According to my experience, the external use of the acids, recommended by Dr. Scott, is more powerful, both as a substitute for mercury, and a means of correcting its debilitating effects, than internal use. It consequently requires more caution, where there are any considerable remains of the inflammatory diathesis; I have known it produce an alarming increase of the inflammatory symptoms.

The dandelion appears to possess greater powers in this disease than are usually ascribed to it, but it requires to be taken in very large doses. It is best adapted to those cases, in which the bile is deficient or much disordered, while the power of the stomach

is still considerable. In such cases, I have seen the patient restored by a strong decoction of dandelion used for common drink, without the aid of any other medicine. In addition to its effect on the liver, it tends to cool, and consequently allay the inflammatory diathesis, and often excites both the bowels and kidneys. The latter effect, which is best counteracted by alum, when the stomach bears it well, is frequently such as to make it necessary to discontinue the dandelion. The former is seldom considerable, and can always be restrained. It is often given with great advantage in aid of the small doses of mercury when the stomach bears it well, and enables us further to diminish the quantity of this medicine. I shall have occasion to make some additional observations on it in speaking of the treatment in the third stage of Indigestion.

Besides the means, the more prominent effect of which is, that of correcting the secretion of bile, there are others often useful, particularly after the general inflammatory tendency has been subdued, and debility becomes the most urgent symptom, which seem to act more uniformly on all the secreting surfaces. For this we are prepared by what has already been said.

We have seen the secondary affections in this disease gradually gaining importance in its progress, and, that if no vital organ is so much weaker than the rest, that the disease fixes on it, producing effects which we are presently to consider, the various organs which have from the first suffered by sympathy, have their powers more permanently impaired; and the disease gradually assumes the form rather of a case of general, and for the most part obstinate, debility, than a disease of any one set of organs.

This form it assumes the more readily, in consequence of a law of the animal economy which has often attracted our attention; namely, that although the sympathetic affections produced by a disease, tend to increase the original affection, in proportion as the secondary affection begins to be changed into actual disease of the part, it tends to relieve the disease from which it sprung. Hence it is, that in the case we are speaking of, in proportion as debility of other parts becomes permanent and inde-

pendent of the cause which produced it, the digestive organs are frequently relieved. It is not uncommon for patients in the state I am speaking of to express their surprise, that they should be so weak, when the stomach performs its office so much better than when they felt comparatively little of this general debility.

The state of the disease before us necessarily supervenes more readily in some than in others; according as the organs secondarily affected are more liable to disease, and no particular organ so much weaker than the rest as to induce the disease to fix particularly in it.

We have now, in some degree, a new disease to contend with. The general sympathetic disease has become that of most importance. Even in this case, however, the pulse is still more or less contracted, and a degree of hardness will be readily perceived in it, if it be examined in the way which has been pointed out; a circumstance, which, with the history of the disease, and some uneasiness being still caused by pressure in the above-mentioned part of the epigastrium, readily distinguishes this state from other cases of debility.

The remains of the original disease to be observed in such cases, together with the good effects which often, for the time, result from every thing which generally excites the secreting surfaces, frequently induce physicians still to look to mercury, given in what is called an alterative course, that is, in doses taken at considerable intervals, as the chief means of relief in such cases; the propriety of which I think many circumstances must lead us to question.

Before the disease arrives at this period, every power of the constitution has been strained by it, and not unfrequently by the means employed for its relief. From mercury in particular, it has generally suffered much; and the bad effects of medicine, like all other morbid affections, gaining force by habit, we see those of mercury now appear from doses, which, at an earlier period, would have produced no sensible derangement.

There is also another point of importance to be considered in such cases. The general debility produced by mercury, when it

is given for the removal of a local disease, is, particularly if it has been successful in removing it, more or less readily corrected, the functions in general being healthy. But in the case before us, where they are in a state of disease, it is corrected, if it be corrected, at all, with great difficulty.

If to the foregoing circumstances we add, that, powerful as mercury often is in exciting the due action of the secreting surfaces in general, it is by no means so powerful a remedy in this respect as in correcting disorder of the hepatic system, the skin and other secreting surfaces often remaining obstinately inactive under its use; and that if it fail to excite the secreting surfaces, its general effects on the system must add to their debility: we shall admit, I think, not only that little is to be expected from it in the case before us, but, as far as we can judge from the known effects of this medicine, and the nature of the disease, there is great risk of its increasing the evil. This inference, however, is not alone the result of reasoning. If we carefully watch its effects, according to any experience I have had in such cases, they will be found to correspond with it. However it may relieve for a little, when resumed after a long interval, its good effects soon disappear, and the only consequences of continuing its employment seem then to be, to add to the debility and hasten the progress of the disease.

Although the state I am speaking of may be considered as comparatively rare, for it is much more common for the diseased action, which has long existed in obstinate cases of indigestion, to fix principally on one organ, than to produce the general state of debility I am here considering; yet we very frequently meet with a state resembling this, before the disease finally fixes on one organ; and particularly in the intervals between the attacks of disease, which that organ generally suffers, before actual change of structure commences in it. To this state, the observations just made, and those I am about to make, equally apply as to that where no organ suffers in particular; except that in the former, the means which influence the whole system, must be combined with those directed to the organ chiefly affected, which we are presently to consider.

I have found the debility most obstinate when least complicated with the determination to particular parts, provided change of structure had not taken place in the latter case. The inflammatory tendency, we have seen, is still shown by the hard pulse, which is relieved with difficulty; because, not depending on the affection of any one part, local evacuations influence it but little, nor are they at all the appropriate remedy; and the general state of debility admits of but a very cautious use of those which produce their effect on the whole system.

Blood-letting is here out of the question. The pulse must be softened by a mild diet and medicines which excite the secreting surfaces, but mercury, we have just seen, is objectionable. The moderate use of saline medicines is among the best means in such cases. It would surprise any one whose attention had not been particularly directed to them, to observe the effects which a diet, composed wholly of vegetable substances and milk, if the stomach can bear it, combined with small doses of such medicines, often produces in those labouring under this form of the disease; who have been vainly endeavouring to support their strength by a large proportion of animal food and tonic medicines. It has long been admitted, indeed, that such a diet is sometimes useful in cases of debility. By this change, the pulse is more or less softened, and the bowels and the skin are relaxed.

It unfortunately happens that the debility is generally such that some portion of animal food is necessary, and a diet wholly composed of vegetable matter is often apt to renew the symptoms of Indigestion. A little of the milder kinds of animal food, therefore, is for the most part necessary, but I have generally seen the best effects from abstaining from it every second or third day.

Great advantage has appeared to me to arise, in the case before us, from sarsaparilla, the continued use of which often seems to give a general tendency to greater freedom in the secreting surfaces. I have repeatedly seen it, by its mild stimulant and tonic powers, succeed where every thing else had failed.

I have also seen strikingly good effects, when the pulse was much contracted, and the skin shrunk and cold, from very small

doses of colchicum; but, like other medicines of this description, it must be used with caution, and no further than is necessary to soften the skin and the pulse. Antimonial medicines, in alterative doses, are sometimes useful, but in general they debilitate too much to be long continued, and their effects soon cease when they are laid aside. The effects of both these medicines, particularly the former, are often improved by combining them with the small doses of opium above mentioned.

We may infer, from what was said of the effect of a damp air in speaking of the causes of Indigestion, that a clear and fresh air is often of the greatest use to the dyspeptic, and the states we are now considering require it more than those of an earlier period.

A very sharp air, however, is unfavourable. It too much promotes the inflammatory tendency, and all sudden changes of weather, on this account, are injurious. It is thus that the spring is the most unfavourable season for invalids of this description; but a heavy still air never fails to depress their spirits and increase the whole train of nervous symptoms.

I have often, during a long residence in a town where the air is too close, both from its low situation and the flat and wooded state of the country, seen these observations strikingly illustrated. Patients of this description drooped in the town, but on being removed to the neighbouring hills of Malvern, immediately revived; and those who at Malvern enjoyed good health, often had a renewal of their nervous and bilious complaints on coming to the closer air.

A free and mild air, a mild and easily digestible diet, regular exercise proportioned to the strength, a regular state of the bowels, a moderate use of saline medicines at the times when the general temperature is increased, or there is a sensation of burning in the hands and feet, and the use of sarsaparilla when it does not oppress the stomach, and such other medicines as excite the secreting surfaces generally without materially impairing the strength, I would say, constitute, according to my experience, the outlines of the best plan in such cases; and I believe mischief is always done by powerful measures.

It is necessary to make the patient sufficiently acquainted with his case to be satisfied with very gradual amendment. I believe mercury should now make no other part of the treatment than in the first stage of the disease. It should only be employed for restoring due action to the liver when this considerably deviates from the healthy state, and then in as small quantity, for as short a time, and with as little impression on the general system as possible.

When other means fail, a voyage and change of climate are often of service; and I believe the waters of Buxton are sometimes useful.

What is called change of air, indeed, although in the same climate, is almost always beneficial in Indigestion, and particularly in the advanced stages. I shall take the present opportunity to lay before the reader the observations which have occurred to me on this subject.

There has been much difference of opinion respecting the cause to which the benefit derived from change of place is to be ascribed. We have reason to believe that it arises from various circumstances, but least of all, in most instances, from mere change of air. It is evident that the air is effectually changed by the wind, and far more rapidly than it can be by any change of place. Yet it is only when the temperature or degree of moisture is changed by the wind, that we can perceive it produce any change in the health, if we except that a certain degree of wind is useful by preventing absolute stillness of the air, which always becomes oppressive when long continued, and that, independently of any impregnation of the air, for it is felt by those who inhabit single houses in the country, as well as by the inhabitants of towns. A free circulation of air is particularly grateful to the feelings, and, as we might from this alone infer, favourable to health.

The truth is, that the air is essentially the same in all places. It has been found by correct experiments, that in the closest parts of London and on the top of the Malvern Hills, it possesses the same proportion of the principle which supports animal life, and

is itself, indeed, in all respects the same; but it is capable of being variously impregnated. The sense of smell at once informs those from the country, that the air of large towns is less unmixed than that which they have been accustomed to breathe.

All impregnation of this kind must, we should at first view suppose, be more or less injurious, and to a certain degree it may be so; but we have reason to believe, I think, that it is much less so than the occasional greater dampness and chillness of the air of large towns, produced in the way pointed out in the second chapter, and the usual greater stillness of the air in them from confinement by the buildings.

The chief impregnation of the air of large towns seems to be from smoke, which does not appear to be particularly unwholesome. It has on the contrary indeed been supposed to preserve from disease, and has often been employed with this view. The other effluvia of such towns are in too small quantity to produce much impregnation of the external air.

I have just had occasion to observe, that the change of air by the wind seems only to affect the health by the motion of the air it occasions, and by its influencing its temperature and degree of moisture. I am inclined to think that it is merely in these ways, which are doubtless in many cases very important, that change of place, as far as the air is concerned, affects us. The air itself, I have just had occasion to observe, is always the same; and its impregnations, unless it be confined, are never, perhaps, such as sensibly to influence the health, if we except those states connected with the production of contagious diseases, which are very little understood.* But there are many other things in change of place capable of essentially influencing it, of which, I believe,

* Some have been inclined to doubt whether the air is ever so changed as to produce disease, independently of the presence of contagion and the changes of its temperature and degree of moisture, but there are some well-ascertained facts which it is difficult to explain on any other supposition. We see contagious diseases, particularly a plague, appearing and declining in different parts of the country, perhaps, hundreds of miles distant from each other, at the same time and without any evident cause, which it would be difficult to account for by any of the known properties of contagion. I have elsewhere had occasion to consider this subject at some length.—*Treatise on Fevers*, p. 158, et seq. fourth edition.

the most powerful is the excitement given by the change itself. How often do we find continual change necessary, the new place being no better than the old, as soon as the novelty of the change is worn away.

To the mere exercise of body occasioned by the travelling, or to which a new situation naturally incites, much must often be ascribed; but, I believe, we must look to the occupation and cheerfulness of mind occasioned by the change for its chief effects. The feelings of sickness on the one hand, like all other feelings, are soon associated with every thing around us; and on the other, the mind, if not forcibly abstracted, fixes intensely on any object, which for a long time chiefly occupies the attention. In long continued sickness, we want something to break that association, and something to divide our attention. What can so powerfully produce these effects as a total change of place? The poor in some parts of this country, who can not afford to send their children to a distance in the decline of hooping-cough, in which change of place is so powerful a remedy, confine them daily for a certain time close to the machinery of a mill, and this often answers the purpose as well.

Let me add, those who ascribe to fancy all diseases which may be cured by change, know little of the nature of disease or the laws of the animal economy. Will they ascribe the hooping-cough to fancy, or eruptions and sores of the surface, pains and stiffness of the joints, and a thousand other ailments, which are often cured by change alone? We have seen how extensive the trains of diseases are, which in many cases depend on affections of the digestive organs; and how much these affections are influenced by the state of the mind, which is very nearly as much the subject of external circumstances as the body.

In the cases, we have last been considering, the patient is not always much emaciated, and is sometimes full and bloated. This seems to arise from the waste being much lessened by a general failure of the secreting powers, and it is not uncommon for loss of flesh to be among the first symptoms of recovery. The increasing power of the organs of supply, if the recovery goes on, soon of course begins to counteract this effect.

As these cases have seldom been accurately distinguished, their treatment must be regarded as in its infancy.* They are sometimes treated merely as cases of obstinate debility, and thus by the tonic means employed, the lurking inflammatory tendency is called into action; and often, at length, shows itself by some of the trains of symptoms, which now demand our attention, the particular consideration of which has, for reasons above stated, been referred to this place.

Of certain Trains of Symptoms whose Treatment does not fall under the general Plan of Cure.

It appears, from what I have already had occasion to say, that the symptoms which arise, when the sympathetic affections begin to have an existence, independent of the cause which produced them, and consequently to require a plan of treatment directed to the parts they affect, show themselves at earlier periods, as well as at the period which we have just been considering. The earlier they show themselves, the inflammatory action generally rises the higher, the later they appear they are the more obstinate, and the more apt to occasion change of structure. This is at all times their tendency, and it is therefore, as I have already had occasion to remark, that they may be regarded as the link which connects what I have termed the second and third stages of Indigestion; the former characterized by the presence of the inflammatory tendency; the latter by the usual consequence of its continuance, change of structure in some vital part.

The class of symptoms, of which I am speaking, more than any other, tends to render the disease complicated, and consequently, at first view, obscure; but a careful study of them un-

* The green jaundice, of which Dr. Baillie gives so valuable an account in the fifth volume of the *Transactions of the College of Physicians*, is different from these cases, incurable organic disease of the liver having almost always taken place in it. In other respects the two states are similar, and it is particularly satisfactory to me, that the observations he makes on the treatment so nearly correspond with the result of my experience. I have also seen his observations on the prognosis, as well as the treatment of green jaundice strikingly confirmed.

folds its true nature, the manner in which it extends its influence throughout the system, and the steps by which it is capable of disorganizing any part of it.

Some of its most striking features, we have seen, arise from the manner in which distant parts sympathize with the stomach. The nature of the affection of these parts, it was observed, corresponds with that of the stomach itself. In the first stage they are mere nervous affections, ceasing as soon as the cause of irritation from which they arise ceases. In the second stage they become inflammatory affections, which have an existence independent of that cause; for the occurrence of the inflammatory tendency in the stomach, immediately produces the same tendency throughout the system, to such a degree indeed, that inflammation readily arises in those parts of it which most sympathize with the stomach, even from causes not connected with the disease.

The secondary symptoms of Indigestion are most easily excited in infancy, and least so in advanced periods of life. In infancy too they are most speedily fatal; but it is from puberty to about forty years of age that they are most frequent, because at this period, their causes are most frequently applied, and the susceptibility of the constitution is not yet greatly impaired. Besides, after forty, we have seen, the disposition to Indigestion is less.

It appears from the enumeration of the symptoms of Indigestion, that the liver is the first organ which partakes of the disease of the alimentary canal. In the first stage, we have seen that its function is generally deranged at an early period; and in the second, that the inflammatory tendency of the pylorus in most cases, soon extends to it. It is also the organ which is most frequently the seat of those trains of symptoms, which we are now about to consider.

It is not uncommon in the second stage of Indigestion, when the patient takes cold, or is exposed to other causes of inflammation, or, indeed, without any evident cause, for the greater part of the right hypochondrium to become full and tender on

pressure, with a sense of oppression and an increased hardness of pulse, often accompanied with some degree of dyspnœa and a dry teasing cough. He sometimes complains of pain in the right, not unfrequently in the left, hypochondrium, or in the pit of the stomach, or in the right, or sometimes the left shoulder, and experiences some uneasiness in lying on either side, particularly on the left, a greater than usual derangement of the biliary secretion accompanying these symptoms. In short, he evidently labours under inflammation of the liver.

It is seldom, however, of the most active kind, requiring general blood-letting, which is fortunate, as patients of this description rarely bear loss of blood well. I have seen many who had long laboured under Indigestion unable to bear the necessary loss of blood, when attacked with acute inflammation. They are, however, comparatively, little liable to it. Their inflammatory attacks generally partake of the chronic nature of the habitual disease, and for the most part yield to local blood-letting and blisters with the aid of a mild diet and saline and aperient medicines.

This treatment, combined with the small doses of blue pill, given in the way above pointed out, never fails to relieve the affection of the liver we are here considering, till its frequent recurrence has rendered it obstinate, and produced some tendency to change of structure.

The pain, it has been just observed, is often felt in the left side, while the tenderness on pressure is wholly confined to the right; but, after the affection of the right side is relieved by evacuations from the tender part, it is not uncommon for the left side to become both full and tender, the inflammatory affection appearing to attack the spleen as soon as the liver is relieved from it; and it will, sometimes, on the fulness and tenderness of the left side being relieved by the same means, return to the liver. This alteration I have seen happen more than once before the disease subsided, in those who had long laboured under the second stage of Indigestion.

Sometimes, though much more rarely, the fulness and tender-

ness appear in the left side alone. The pain is then more confined to the seat of the tenderness. The same means are here proper, with the exception of the blue pill, which seldom seems to be of much service in this affection; and the employment of which must therefore be regulated by the state of the other symptoms.

The chief seat of such attacks, however, is often in organs at a greater distance from that of the original disease. I shall, in the first place, mention the lower bowels, because these are more immediately connected with the disease, and are injured, not only by sympathy with the higher parts of the canal, but more directly influenced by their vitiated secretions and the undigested food.

The irritation of the bowels, which attends the first stage, is for the most part easily relieved by purgatives and anodynes. In the second stage it often becomes obstinate, and shows the same inflammatory tendency which now characterizes the primary disease. The hypogastrium becomes full and tender on pressure, and the irritation which exists there increases the general tendency to fever.

We should *a priori* expect that the lower bowels would suffer more than other parts of the canal, especially when the disease is of long continuance, the morbid contents of all the rest passing by them. The sigmoid flexure of the colon appears to be the part most liable to be affected, probably from the contents lodging there longer than in other parts of the large intestines. It is not uncommon in protracted cases, to find a considerable degree of tenderness in the seat of this part, which is sometimes at length affected with ulceration. It is also, probably for similar reasons, common, though not so much so, to find tenderness on pressure in the seat of the cœcum. In other instances it is more general.

Opening medicine, in such cases, seldom gives much relief, and often increases the irritation; nor have I found any means effectual without those which lessen the inflammatory state of the parts. The application of leeches to the part most tender on pressure, and the use of mucilaginous and anodyne clysters seldom fail to give relief, and then mild aperients generally succeed

in procuring a free action of the bowels. It is sometimes necessary to repeat these means, and when the symptoms are obstinate their good effects may be promoted by the tepid bath; but I have seldom found fomentations of the abdomen of much use, although a large poultice applied over the lower part of it sometimes appears to be of service.

Both from the passage of the vitiated contents of the bowels, and from the return of the blood through the hepatic system being rendered less free, those who have long laboured under Indigestion, are particularly subject to piles; great relief is generally obtained in the affection of the bowels, we are considering, when they bleed freely; and when they exist to a considerable degree without bleeding, the application of leeches to them is sometimes the best mode of letting blood in that affection. I have repeatedly observed, even where it had not gone the length of producing decided inflammatory symptoms, but the patient had for some days been teased by scanty, irritating and unsatisfactory evacuations, that after a small spontaneous discharge of blood from the piles, the bowels have emptied themselves with freedom and ease. Foreign, particularly French, physicians, place great reliance on bleeding from the seat of the piles, even where no degree of this disease exists, in all inflammatory affections of the bowels. Dyspeptics we have seen are often subject to more or less permanent spasmodic stricture of the rectum, this is most apt to occur when some degree of inflammatory tendency in the bowels have supervened, and we have reason to believe that when frequently renewed it may end in organic stricture. This, however, is certainly not a frequent occurrence. When Indigestion is complicated with organic stricture of the rectum, it will generally be found, I believe, that the stricture is the primary disease.

Every cause of irritation of the alimentary canal is apt to renew the inflammatory tendency in the bowels, particularly the repeated use of mercurial medicines. It is also frequently renewed by cold or other causes of inflammation. The best means of prevention are a very mild and rather mucilaginous diet and a free state of the canal.

The chest frequently suffers in the second stage of Indigestion, the dyspnœa, which we have seen an occasional attendant at all periods of the disease, becomes more permanent, with a sense of oppression and difficulty of lying in the horizontal posture, and an increase of the tenderness of the epigastrium, the hardness of the pulse, and burning of the hands and feet. The feeling of oppression is greater than seems to belong to the degree of the dyspnœa, and is much increased by all active exercise. A short dry cough sometimes attends, but is by no means a constant symptom; a circumstance which, with the absence of any thing that deserves the name of fever, often deceives respecting the inflammatory nature of the affection. Blisters generally give relief, but we still find local blood-letting the most certain and expeditious means.

The increase of the tenderness of the epigastrium, hard pulse, and feverish symptoms distinguish this affection from another species of permanent dyspnœa, which we found a frequent attendant on Indigestion, and which I shall soon have occasion more particularly to consider. It seems to be wholly a nervous affection, and frequently to be the effect of repeated attacks of the inflammatory dyspnœa, which is still apt to be renewed, and consequently to become complicated with it, when the patient is exposed to taking cold or any other cause of inflammation.

Palpitation we have seen is sometimes a symptom of Indigestion, and is, for the most part, readily relieved by means already pointed out; but in some instances the affection of the heart becomes so obstinate, that I have repeatedly known it assume the form of angina pectoris, and be treated in vain as such, for several years; yielding, at length, to means which restored due power to the digestive organs. All affections of the heart becoming obstinate in the second stage of Indigestion with an increased hardness of pulse, are relieved by loss of blood; and I have seen decided carditis supervene under such circumstances, requiring the frequent repetition of copious general blood-letting.

It is a common observation that carditis is apt to supervene after repeated attacks of rheumatic pains of the limbs. I believe from

many cases which have fallen under my observation, that it will generally be found in such instances, that the rheumatic pains had been combined with, and in a greater or less degree dependent on, disorder of the digestive organs.

The pains of the limbs arising from this cause, will often completely assume the form of rheumatism, and become very obstinate, if the cause which supports them be overlooked; which is the more likely to happen, because here, as in other cases, cold is very often their immediate exciting cause. I have seen severe pains of the limbs which had long resisted the means usually successful in rheumatic cases, wholly removed, by combining with these means, the treatment adapted to the second stage of Indigestion.

But of all the sympathetic affections of distant parts in Indigestion, none are so frequent as those of the head. In the second stage, they usually assume the same inflammatory character with the other affections belonging to this stage. From the function and situation of the brain, however, the nervous affections of this organ connected with a diseased state of the stomach, assume a more formidable appearance than those of other parts, and consequently demand more attention. After considering the former, therefore, I shall lay before the reader the observations which my experience of the latter has suggested.

Head-ach, we have seen, is one of the most common symptoms, both of the first and second stage of the disease, sometimes, indeed, Indigestion shows itself only by this symptom. In the milder cases this is by no means uncommon, and it now and then happens in the most severe. I was one of many physicians who were consulted in a case where violent pains of the head had resisted every means which could be thought of. The disease proved fatal, and we expected to find great disorganization in the head, to which all the formidable symptoms had been referred. No trace of disease, however, could be found in it, and the organization of the liver seemed to be wholly destroyed.

In the first stage, head-ach is generally a mere temporary affection of the nervous system, and, indeed frequently supervenes on

other nervous symptoms, which it relieves. It is particularly apt to be preceded by affections of the sight, and may often be removed by emetics and cathartics, which remove the immediate cause of irritation. When severe, indeed, it is frequently relieved by spontaneous vomiting. The head-ach of the second stage is often more obstinate. Emetics and cathartics, indeed, also frequently relieve it, because these not only remove the cause of irritation, but occasion depletion of the vessels of the head. The most effectual remedy, however, is blood-letting from the head. The head-ach of the first and second stages of Indigestion, besides the accompanying symptoms may generally be distinguished by the latter being greatly increased by stooping or when the patient holds his breath, and forces the blood towards the head, while this is rarely the case with the head-ach of the first stage, and never to the same degree, a circumstance very characteristic of the nature of these affections.

The head-ach of the second stage sometimes becomes very formidable when its inflammatory nature has not been understood, occasioning the most agonizing pain, and even delirium. No case of it has occurred to me in which bleeding from the head did not give immediate relief. Blistering the nape of the neck is often of service, but as it often fails, and the relief is never so speedy, and seldom so complete as from local blood-letting, the latter, unless the strength is much reduced, is preferable; to say nothing of its effect on the habit in general, which, when the head-ach has frequently returned, is beneficial, for local of course is also general blood-letting as far as it goes; and from the nature of the circulation in the encephalon, the blood being returned from it by inanimate canals which can not partake of the excitement, there is no other inflammatory affection to which a generally increased action of the sanguiferous system so much disposes as to that of the brain. Blisters are a powerful means of preventing the return of the pain.

It often happens, apparently for the reason just mentioned, that this inflammatory state of the head requires a lower diet, and more frequent repetition of the blood-letting, than the other affections we have been considering.

Here, as in all cases of inflammation, however little general blood letting may seem to be indicated in the first instance, when local blood letting has been frequently repeated, without subduing the hardness of the pulse, or preventing the recurrence of the symptoms, the greatest advantage often arises from letting blood generally. In such cases, indeed, it becomes indispensable. The strength may be exhausted by the constant repetition of the local blood-letting, without the tendency to the disease being subdued.

From the blood being taken more slowly, local, even to the same extent, never produces the whole effect of general blood-letting. I have repeatedly seen the pulse softened, and the recurrence of the disease prevented, by one general blood-letting, and that to no great extent, when frequently repeated local blood-lettings had had little effect beyond the present relief they afforded.

General and local blood letting relieve inflammation in different ways. The former, by lessening the *vis a tergo*, tends to prevent farther congestion in the inflamed part; the other by lessening the quantity of blood in the part, to relieve more directly that which has already taken place. Now, although the quantity of blood in the inflamed part is repeatedly lessened, and thus the inflammation for the time relieved, the general inflammatory action continuing, the vessels again suffer distention, till this action is subdued by general loss of blood.

On the other hand, I have seen many cases where repeated general blood-letting had failed to subdue inflammation, in which it has ceased on the local abstraction of blood.

Here the generally increased force of the circulation had been sufficiently subdued, the *vis a tergo* sufficiently lessened; but the long debilitated vessels could not recover their usual diameter, till more directly relieved from the blood which had distended them beyond it. It is evident that it is in protracted cases that both these states must occur; but their existence seems sufficiently to evince the propriety of combining local and general blood-letting in all cases of active inflammation.

If the foregoing observations be correct, little advantage is to be expected from general blood-letting, when there is no general

increaseed excitement of the circulation. This inference seems fully warranted by experience, for under such circumstances, the loss of two ounces of blood from the part affected often gives more relief than that of a pound from a distant part.

Blood-letting seldom does much good in the head-ach of the first stage of Indigestion. If it is not relieved by clearing the stomach and bowels, and the use of what are called nervous medicines, a pretty large blister applied to the nape of the neck, or behind the ears, is the most effectual remedy.

The effect of nervous medicines in relieving it, is often considerable, but very uncertain. In many cases they seem to do little or no good. Valerian and conium appear to be the most frequently successful. Opium is ill adapted to this head-ach, any relief obtained from it being generally more than compensated by its effects on the stomach and bowels. Opium in the head-ach of the second stage is out of the question; but I have found that after the hardness of the pulse is to a certain degree subdued, such a use of the compound powder of ipecacuanha as supports a general tendency to moisture on the surface, provided means are employed at the same time, to keep the bowels free, is very useful in preventing its return. The effects of this medicine seem sometimes improved by combining an antimonial with it. In many cases, particularly in the early period of the second stage, and when its characteristic symptoms are not very prominent, the head-ach seems to partake of the nature of both stages, and is best relieved by a combination of the above means.

It sometimes happens in the second stage that the head-ach assumes a chronic form, continuing for weeks or even months, without being very severe. Both local and general blood-letting then very frequently fail to give permanent relief. The best means are those which support an habitually free action of the bowels and skin, and most effectually correct the disease of the digestive organs; and permanent drains from the neighbourhood of the head.

Alarming as some of the inflammatory affections of the head are, its nervous affections connected with irritation of the diges-

tive organs, contrary to what we see in other parts, are often still more so; and when they occur in the second stage, supersede the inflammatory tendency. They appear to be of two kinds; the one arising from long-continued irritation of the nerves of so important a part of the system as the digestive organs, directly debilitating and sometimes wholly destroying the source of nervous influence, the other from this irritation affecting the state of the vessels of the brain, and consequently the distribution of that portion of the blood which is sent to the head.

The former of these is only a greater degree of the affection which is usual at all periods of Indigestion. Giddiness and temporary loss of power or vitiated feeling in various parts of the body, we have seen, are not uncommon symptoms even from the commencement. But it is in those cases where powerful and repeated causes of irritation on the one hand, and, on the other, the debility occasioned by long-continued indigestion, which every where affects the secreting power, and consequently the state of every part, have gradually enfeebled the functions on which the supply of nervous influence depends, that these symptoms become formidable. It is not very unusual, under such circumstances, to see the patient, after more severe attacks than usual, and sometimes without this warning, suddenly fall down, and in a few hours, and in some cases, almost immediately, expire.

In such cases the aids of medicine are vain. The powers of the constitution are not oppressed by disease, but worn out by its continuance. This is what in contradistinction to apoplexy arising chiefly from the state of the vessels, is properly termed nervous apoplexy, the most fatal of all its forms; and it has been remarked that in some cases, no morbid appearance presents itself on dissection. The fatal derangement is in the nervous system alone, whose structure is too minute for our observation. If the usual plan of bleeding in all cases of sudden insensibility be here resorted to, the disease is only the more suddenly fatal.

The state of the brain in such cases resembles that which surgeons call concussion. Its mechanism is deranged. The differ-

ence is, that in the one this mechanism is deranged by a sudden and violent cause, applied while the powers of the system are entire; and which consequently, if the little strength which remains be carefully husbanded, may often repair the injury: the other is the effect of a succession of slight causes gradually changing the mechanism of the brain, and at the same time exhausting the powers of every other part, so that the constitution possesses no means of repairing the injury

The pure nervous apoplexy, however, as here described, is necessarily an extremely rare disease; because it very seldom happens that the causes continue long enough so to derange the finer mechanism of the brain as to produce loss of function, without influencing the state of the circulation in it in such a manner as to produce a fatal effect in this way.

There is something at first view very inexplicable in the phenomena of apoplexy, such as it often appears in those who have long laboured under the more severe forms of Indigestion. Dissection has not only shown that sanguineous apoplexy, which is generally attended with a flushed countenance and strong beating of the temporal arteries, sometimes occurs, when from the paleness of the countenance and the previous symptoms, as well as nervous habit of the patient, we should have expected to find the blood in the brain rather below than above the due quantity; but that such is often the state of the circulation in this organ, when the countenance, on the attack of the apoplexy, becomes much paler than before, and the beating of the temporal arteries, hardly perceptible. Nay, such cases will often be relieved by blood-letting, although it is always prudent to employ it with the greatest caution; for, independently of other considerations, we have no certain means of distinguishing them from the case we have just been considering, in which blood-letting always hastens the fatal termination. If the case admits of relief from blood-letting, the smallest loss of blood from the head, is immediately attended with a diminution of the insensibility.

When we consider the free communications which exist between the vessels of the brain and those of the external parts of

the head, and that both are supplied from the same trunks, great turgescence and fulness of the former appear, at first view, altogether incompatible with a shrunk and comparatively empty state of the latter; yet no physician has practised long without having proofs of the existence of the state here described. I have repeatedly seen, in an exhausted constitution, the face become suddenly pale, and all power lost, the patient falling down insensible, and the countenance continuing to increase in paleness till it assumed a cadaverous hue; and yet this patient has been immediately restored to the use of his faculties; the paleness of his countenance at the same time abating, by the loss of blood; and there is every reason to believe would have died without it.

The brain, we have seen, is one of those parts which are most apt to sympathize with the digestive organs; even in slight attacks of Indigestion, its powers are not unfrequently so enfeebled, that all its functions are impaired. This debility extends to, and indeed seems sometimes chiefly to take place in, its vessels.* We know, from the evidence of dissection, that in such cases they suffer themselves, and that often very suddenly, to be morbidly distended by the usual *vis a tergo*, and thus to receive a greater than usual share of the blood sent to the head. The external vessels consequently receive a smaller quantity; hence the paleness of countenance on the attack of this species of apoplexy, and the increasing paleness in proportion as the blood accumulates in the encephalon, owing to the increasing debility of the vessels of the whole, or some particular part of it.

When the minute vessels are distended, inflammation is the consequence; when the larger vessels, congestion, which in the head occasions apoplexy. In inflammation of the brain, the parts affected are found uniformly red. In apoplexy there is little of this uniform redness, but the larger vessels are preternaturally distended.† I speak not here of the more common case of rupture of the vessels.

* It appears, from direct experiment, that affections of the nervous system are capable of instantly depriving the vessels of their power.—*Inquiry into the laws of the vital functions*, Exper. 27, 28, 29.

† See *Inquiry into the laws of the vital functions*. Second edit. p. 301, *et seq.*

Thus it is that, in such cases as that before us, the inflammatory tendency in the brain is superseded. The trunks of the vessels themselves being debilitated and distended, can no longer supply the *vis a tergo* which supports the preternatural distention of the capillaries, which therefore retain their usual diameter, and consequently, as far as they are supplied with blood, their functions.

The loss of blood takes off the state of extreme distention, which supports and increases the debility of the vessels, the immediate cause of which is often of a transitory nature, and thus enables them to recover their usual diameter; in consequence of which the external vessels again receive their due proportion of blood. Thus, at the same time that the sensibility is restored, the countenance regains its colour.

It is probable that this state of disease sometimes originates from causes acting directly on the brain itself; but in most instances we have reason to believe, that it originates from irritation of the stomach and other digestive organs. It is most apt to supervene in exhausted states of the constitution, or in what are called very nervous habits, and is evidently of a different nature from distention of the vessels of the encephalon arising from general fulness, aggravated in the head by any occasional cause, a distended state of the stomach, for example, pressing on the descending aorta, a common cause of apoplexy in the plethoric.

It is evident, that in the apoplexy we are considering, loss of blood from the head, and that only to such an extent as relieves the symptoms, is alone proper; although as I have witnessed, the incautious use of general blood-letting in such a case is followed by immediate relief; but it is also followed by a degree of debility which further disposes to returns of the attack, as well as to other diseases.

Slight irritations of the stomach often debilitate the external capillary vessels of the head, where they are most delicate, in consequence of which they for the time suffer morbid distention, particularly if the late reception of a meal gives more than usual vigour to the *vis a tergo*. Hence the flushing of the face of dys-

peptics after dinner, especially when they have taken any thing which disagrees with the stomach. There can be little doubt, I think, that this tendency in irritation of the stomach to debilitate, and consequently occasion distention of, the vessels of the head, concurs with the pressure on the descending aorta to produce the apoplexy which is so apt to arise after a full meal. In the advanced stages of Indigestion this effect is determined to the internal, more readily than the external, vessels of the head, by the debility induced on the former, in consequence of their greater sympathy with the long-continued irritation of the digestive organs.

I had occasion to observe, in speaking of the relation which subsists between the sympathetic affections which attend Indigestion and the original disease, that the relation between the latter and urinary gravel, depends less on any sympathy which exists between the stomach and kidneys, than on the generation of acid in the alimentary canal in Indigestion. We find this observation further illustrated by the symptoms we have just been considering.

We have seen, that the internal organs, sympathetically affected in this disease, are peculiarly liable to inflammatory affections in the second stage, producing the different trains of symptoms which have been laid before the reader. The kidneys, however, seldom show any tendency of this kind; although it is not uncommon in Indigestion, for the acrid state of the urine, arising from the superabundance of acid and its other saline contents, occasioned by the greater generation of acid in the alimentary canal, and the inactivity of the skin, so to irritate the urinary passages as to occasion frequent micturition, and a sense of burning, and other painful sensations in these passages, even when no deposition of lithic acid* takes place in them.

*As it is an acknowledged fact that the excessive use of distilled spirits, and other fluids containing alcohol, tends to produce urinary gravel, I was induced to make some experiments for the purpose of ascertaining how far the addition of alcohol to the urine, after it is out of the body, tends to promote a deposition of lithic acid from this fluid. I found, however, from repeated trials, that it had a contrary tendency, both retarding the deposition of this acid and greatly lessening the quantity deposited, which, probably in consequence of its being deposited more slowly, appeared in larger and more distinct chrystals when the alcohol was added to the urine. This com-

Such symptoms may generally be relieved by diluting and mucilaginous fluids, but they can only be permanently removed by preventing the morbid generation of acid in the alimentary canal, and restoring due action to the skin.

It is almost unnecessary to observe, that in all the foregoing cases we must keep in view the origin of the disease. The debility of the digestive organs, however relieved by the secondary disease, is easily renewed by any cause deranging their functions, and always has the worst effect. All the regulations respecting regimen, then, and even the occasional use of stomachic medicines are proper, as far as the symptoms of that disease admit of them.*

I shall not prolong this part of the treatise by observations on the connexion of Indigestion with hydrencephalus internus, epilepsy, affections of the mind, and other diseases of the head, respecting which many valuable observations have been made by several writers; but close my observations on the second stage of Indigestion with some remarks on the manner in which it influences the phenomena and treatment of the fevers of this country. By the second stage of Indigestion, we have seen, is meant such disorder of the stomach as has, by continued irritation, occasioned in the pylorus a state, if not of inflammation, inclining to it, accompanied with an inflammatory tendency throughout the system, which is apt to show itself chiefly in those parts which most sympathize with the stomach.

On the concurrence of the second stage of Indigestion and Fever.

The concurrence of the second stage of Indigestion and fever is perhaps the most common combination of disease which is pre-

bines with other circumstances in proving, that, contrary to the opinion of M. Majendie it is by the debility its incautious use induces on the digestive organs, and not by any direct influence on the urine, that alcohol disposes to urinary gravel. To what cause can we ascribe the diminished tendency of the urine to deposite lithic acid, when the common spirit of wine of the shops, or rum, the forms in which I used the alcohol, are added to it?

* I have, during the last five or six years, recommended galvanism in certain protracted cases of Indigestion. I shall have occasion, in the last chapter of this treatise, to point out the circumstances which led to its employment, the mode of using it, and the effects to be expected from it.

sented to us. It arises either from fever attacking those labouring under this stage of Indigestion, or from the latter supervening in the course of the fever.

From the attention of physicians having lately been much directed to the local affections, which, although not essential to, often attended fever, has arisen one of the greatest improvements in its treatment; for these local affections being all of an inflammatory nature, support and aggravate the general disease.

I shall here beg leave to quote what is said of the nature of fever in the preface to the fourth edition of my *Treatise on simple and eruptive fevers.* The more I have considered the subject, and observed the course of febrile diseases, the more it appears to me, that the view there taken of it is consistent with the phenomena of those diseases, and leads to the proper treatment under their various forms. But my reason for troubling the reader with it here is, that it seems to explain the relation which subsists between them and the disease which forms the subject of this treatise.

"It is impossible to subject the whole system to sufficiently minute observation, to make the immediate cause of fever the subject of experiment; but we know that there are local diseases capable of exciting fever, and it may be possible to ascertain by experiment the state of the part on which these local diseases depend, and thus to arrive at a knowledge of one or more changes in the vital organs capable of producing fever, and by comparing the phenomena of these diseases with those of simple fever, to ascertain how far the same changes which we observe in the part obtain throughout the system, as soon as the irritation occasioned by the state of that part, or any other cause, produces fever.

"It appears, from some experiments made with the assistance of the microscope, related in the introduction to my treatise on symptomatic fevers, to which I have already had occasion to allude, that inflammation arises from debility of the capillary vessels, and their consequent distention by the *vis a tergo*, and that we can at will produce inflammation by debilitating the capillaries, and relieve it by increasing their action. Wherever, therefore, the symptoms of inflammation, increased temperature, redness and

swelling appeared, the capillary vessels are debilitated, and preternaturally distended.

"Now, in the hot stage of fever, all the surfaces are affected with increased temperature, redness, and swelling; and as the debility and consequent distention of the capillaries of a part, as appears from direct observation, produce increased action of the larger arteries of the part, this general debility and distention of the capillaries produce increased action of the whole arterial system. In inflammation, the debilitated vessels being comparatively few, the *vis a tergo* quickly, and to a great degree, distends them. In fever, the debilitated vessels being very numerous, it produces its effect more slowly, and to a less degree, in proportion as the resistance is greater.

"If in any part the vessels are weaker than in others, they suffer a greater degree of morbid distention, particularly after the increased action of the heart and large vessels has been excited. Hence arise the congestions and inflammations so frequent in fever. These act as, we have seen, inflammation does in other cases, in supporting the morbid excitement of the heart and larger arteries. Thus, it is that the treatment of such affections is of the first importance in determining the course of the fever."

It is unnecessary here to pursue this subject farther. The cause of the cold preceding the hot, stage of fever; and the *modus operandi* of the causes of this disease are considered in the above Treatise.

Now, in those who labour under the second stage of Indigestion, we have seen that some of those parts which greatly sympathize with the stomach, generally suffer most. These, therefore, are the weak parts which most feel the effect of the morbidly increased force of circulation in fever. Their vessels are most apt to suffer distention, producing congestion or inflammation, according as the distention is in the larger or smaller vessels.

The liver, it appears, from what has been said, is the part which most frequently suffers by sympathy in the second stage of Indigestion. It therefore often happens that, when those labouring under this stage are attacked with fever, a train of symptoms

similiar to that detailed in page 138, supervenes, the proper treatment of which is essential to that of the fever.

The principle of the treatment of these symptoms, when they occur in fever, is precisely the same as where they supervene without it, but the actual practice is not altogether so. The fever, in its early stages, by adding to the severity of the inflammatory symptoms, renders more active means necessary. Hence, if the general symptoms do not indicate general loss of blood, a greater local abstraction of it is usually proper, than when no fever but that occasioned by the local affection attends.

The same observation applies to the use of cathartics. At the commencement of fever, the free action of the bowels is particularly beneficial, and by such a state of the liver is rendered doubly so. It is thus that brisk doses of calomel at this period are generally more beneficial than other mercurials.

In the latter stages of fever, on the contrary, if this affection of the liver still continue, which is not uncommon, either from its having been neglected in the early stage, or from its proving more obstinate than usual, I have always found the minute doses of blue pill above specified, given every six or eight hours, most beneficial. Combined, indeed, with moderate evacuations of blood from the part, or (when the tenderness is inconsiderable, and the affection of the liver rather betrays itself by a vitiated secretion of bile, than by inflammatory symptoms,) blisters applied to the region of this organ, they rarely fail to restore due action to it, unless the nature of the fever, or constitution of the patient, be very unfavourable; and thus often remove the fever, which, when its symptoms have become mild is frequently at this period prolonged by the local affection alone.

When the sympathetic disease, previous to the attack of fever, has chiefly affected other parts, the bowels. the lungs, the brain, &c., we still find the part most affected by that disease, suffering most in the fever; and the same plan of treatment, *mutatis mutandis*, is applicable, except that the same benefit is not to be expected from the specific operation of mercury.

When Indigestion has not arrived at its second stage at the

time the fever makes its attack, the accession of this disease, by increasing the inflammatory tendency, often induces that stage. The vessels, although they had not been sufficiently weakened to yield to the usual force of the circulation, yield to its increased force; and it particularly deserves attention, that an attack of fever, as I have repeatedly witnessed, is often the means of permanently converting the first into the second stage of Indigestion; so that the fever leaves behind it tenderness of the epigastrium, and more or less hardness of the pulse, where they had not previously existed.

When this is the case to any considerable degree, the patient generally becomes liable to a renewal of fever from slight causes; and if the morbid state of the digestive organs is not removed, he is often exhausted by repeated attacks of fever, which, as the debility increases, assume a more chronic form, and often at length terminate in typhus, or the more severe species of what has been called nervous fever.

Local congestion or inflammation, as might be expected, although none of the symptoms of Indigestion have preceded, sometimes takes place in fever, that is, when the force of the circulation is morbidly increased. This is most apt to happen in the brain or liver.

The principle treatment, as far as I have been able to observe, is still the same. In the latter case, however, the means of relief are generally sooner successful, and the patient bears them better. The treatment of fever, in those who have long laboured under the symptoms of Indigestion, requires great circumspection. It is surprising after how moderate a degree of fever symptoms of danger often arise in them, and indeed death itself actually ensues. Both the vascular and nervous systems of some organ necessary to life have been previously enfeebled, and it wholly loses its power before the fever produces any very great general effect. The patient dies as much of the disease under which he has so long laboured, as of the fever which has supervened on it, and that at a time perhaps when his physician's mind is fatally abstracted from the former. These observations have been so often

impressed on me in the course of practice, that I can not help, in a particular manner calling the attention of others to them. The more we see of disease, we shall, I think, be the more ready to admit that the digestive organs form so important a part of the animal system, and are so intimately connected with every other part of it, that there is no case in which their state can with safety be disregarded.

Recapitulation.

We have now traced Indigestion from its commencement to the moment at which it is about to terminate in organic disease; for a repetition of the local affections we have been considering almost always terminates in change of structure which when thus produced, seems in no degree to differ from organic disease of the same parts, arising from other causes.

It may be useful here to present to the reader a short recapitulation of the different parts of the subject which have engaged our attention.

In the commencement of the disease, we have seen, that the muscular and nervous powers of the stomach are enfeebled, and that the debility gradually extends to the other parts of the alimentary canal, to the liver, and at length, more or less, to every part of the system.

The irritation caused by the contents of the stomach, which, from the debilitated state of the nervous and muscular powers of this organ, have acquired morbid properties, at length produces a degree of inflammatory action, that is, debility of the capillary vessels, and its immediate consequences, in the part of the stomach most exposed to it, the symptoms of which I have regarded as characterizing the second stage of the disease; and, as in the first stage, the deranged function of the stomach produces a tendency to deranged function in every other part, in the second stage, every other part, in like manner, partakes of this inflammatory tendency. The pulse becomes hard, and inflammation is every where readily excited, particularly in the parts which most sympathize with the stomach, or are from other causes most liable to disease.

In the first stage, the debility of the nervous and muscular powers of the stomach is to be counteracted by attention to diet and exercise, and a proper use of aperient, stimulant, and tonic medicines; and, in proportion as it is relieved, the sympathetic affections, which depend on it, disappear.

In the second stage, it is necessary to obviate the inflammatory tendency, and only to employ the means suited to the first stage, as far as they are compatible with this object; while our attention must now at the same time be directed to the parts sympathetically affected, in which, from the longer continuance of deranged function, and the inflammatory tendency prevailing throughout the system, the sympathetic begins to be changed into real disease.

The affection of these parts, we have seen, like that of the stomach, from which it arises, now consists in a debility of the vascular, as well as nervous, power. On these powers depend the secreting and absorbing processes, which are as necessary to the continuance of the healthy structure as the healthy function of the part; except that, from the nature of the function it is immediately affected, from that of the structure, its changes take place more slowly.

When Indigestion has produced change of structure, it constitutes, we have seen, what I have called the third stage of this disease, which we are now to consider more particularly.

CHAPTER IV.

OF THE THIRD STAGE OF INDIGESTION.

The stomach is less liable to change of structure than most other organs. This change, therefore, although sometimes taking place in it, is much more frequent, as I have already had occasion to observe, in the parts with which it sympathizes.

The diseases, which thus arise from neglected Indigestion, are so various, and so different from the disease from which they spring, as well as from each other, that to give any thing like a satisfactory account of them would require a treatise of greater extent than the whole of that now presented to the public, and a superficial account would be worse than none. I shall therefore consider only those cases, to which, from their great frequency in this country, my attention has been particularly directed, I mean the pulmonary affections produced by a disordered state of the digestive organs; and the principles, which I shall have occasion to illustrate in treating of those diseases, will be found applicable to others arising from the same source.

Organic disease, in the common acceptation of the term, is disease attended with such change of structure, as is apparent on dissection after death. This involves a change of structure in all the parts of the diseased organ. We can not doubt, however, that there is a change of structure in the finer parts of our mechanism, which leaves no traces to be detected after death. Thus we have seen, that in those who have long been exposed to causes of great nervous irritation, the function of the brain and spinal marrow sometimes fails. The usual stimulants cease to produce their accustomed effects. This at first is only occasional, and the organs soon resume their usual functions; pointing out that, however their action has been oppressed, their mechanism is still

entire; and has, if disordered at all, only been temporarily so: but, by degrees, the diseased state becomes more permanent; and, at length, sometimes ends in that species of palsy, or apoplexy, in which, although the permanent inability proves, dissection can not always detect, change of structure.

I have often had occasion to call the reader's attention to a fact, which is at once evident to all in the least degree acquainted with the structure and functions of the animal body, that it must, except under particular circumstances, be through the nervous system, that any organ can be influenced by a distant part. We have also seen an intimate connexion between the function of the nerves and that of the vessels in those processes, on which the constant changes going on in the body depend. The nerves of a secreting organ are never disordered without influencing the secreted fluids; and, consequently, without tending to influence the vessels which supply the fluids, from which those are formed. Thus it is, in the common course of things, that sooner or later, in cases of long-continued nervous irritation, the vessels either of the part to which the irritating cause is applied, or some part which sympathizes with it, deviate from the healthy state. This we have seen, constitutes the difference between the first and second stages of Indigestion. In the former, the nerves and secreted fluids alone are affected; in the latter, the vessels partake of the disease.

The facts just stated, however, prove, that in some cases, where either the nerves are more liable to disease than usual, or the vessels less so, a permanent change in the former takes place before the vessels become affected, this change either occurring in the nerves of particular organs, or in the general source of nervous influence; producing in the one instance permanent loss of power in a part, in the other, in the whole system.

This permanent change, if the animal be capable of surviving it, operates as all other established disease does in tending to prevent disease of other parts; and thus the vascular system of the organs affected, notwithstanding the vitiated state of their secretions, often for a long time, retains its healthy functions. In such

cases, however, there is necessarily a tendency to affection of the vessels which is indicated by a degree of sharpness of pulse, which may almost always be observed in them.

Thus we find on inquiry, that the permanent diseases of distant parts produced by sympathy, with the state of the stomach in Indigestion, are of these two kinds, namely, that in which the nerves alone, and that in which both the nerves and vessels are affected. Of these the one in which the vessels as well as the nerves are involved, is by far the most frequent.

Of those two kinds, then, are the sympathetic affections of the lungs which we are about to consider. In the one, the disease has extended to all the vital powers of this organ; in the other, to its nerves alone.

Some years ago I presented to the Medico-Chirurgical Society, an account of the former of these under the name of Dyspeptic Phthisis, which, as I have already had occasion to observe, the society did me the honour to publish in the seventh volume of their *transactions*. This account I am here about to present to the reader, with the additional observations which I have since made on that disease.

The disease produced by a permanent derangement of the nervous power alone of the lungs, for want of a more appropriate name, I called habitual asthma. My attention was first attracted to it by finding, that the difficulty of breathing produced by Indigestion, when it had lasted for a considerable time, often did not yield with the other symptoms of this disease; and then generally resisted the effects of medicine.

This affection, in many instances, gradually increases, notwithstanding every effort to relieve it, till it unfits the sufferer for all the active duties of life. It was with peculiar satisfaction, therefore, that I found galvanism an almost uniform means of relief in it, and not unfrequently of cure.

This induced me, in 1816, to present some observations on this effect of galvanism, and my reasons for believing that habitual asthma depends wholly on an affection of the nerves of the lungs, to the Royal Society; which did me the honour to publish

them in the philosophical transactions of the following year. I shall, after considering dyspeptic phthisis, lay before the reader the observations there published, with such additions as have since occurred to me.

SECTION I.

Of Dyspeptic Phthisis.

It is very common for the different species of pulmonary consumption to be regarded as the same disease, and treated in the same way; yet it will be evident, I think, from the following observations, that the nature of that species which I am about to consider is peculiar; and that while under the common treatment, it is nearly as fatal as the other forms of the disease, under that which is suited to it, its progress may generally in the earlier, and sometimes in the more advanced stages, be arrested.

I shall in the first place, point out the symptoms by which this species of pulmonary consumption is distinguished; then make some observations on its causes, and the appearances discovered by dissection after death; and, in the last place, I shall detail the plan of treatment which I have found most successful in it.

Of the Symptoms.

I had occasion about sixteen years ago, to mention this species of consumption and the plan of treatment which appeared to me best adapted to it, in my *Treatise on Febrile Diseases*. Since that time it has particularly attracted my attention: It can not, therefore, I think, fail to be of some use to those whose attention has also been directed to it, to see the observations I have been led to make in so many years experience of it; for there are few diseases so frequent in the part of England in which I have resided, and indeed, I believe in most parts of Great Britain. To those whose attention has not yet been particularly directed to it, any observations on it must be useful.

It is not my intention to give a detailed account of the symptoms of this species of phthisis. I shall only mention the symptoms and modifications of symptons by which it is distinguished.

It is generally preceded, as appears from what has been said, by symptoms of Indigestion, and particularly by those which indicate some disorder in the secretion of bile. Contrary to what is usual in other species of the disease, the spirits from the beginning are generally more or less depressed, and the countenance is sallow.

The cough at first is usually dry, or the patient brings up a little mucus after a severe, and often long-continued, fit of coughing, which seems to be rather the effect of the irritation of coughing than any thing which had previously existed in the lungs; for the cough in this species of consumption, particularly in its early stages, frequently comes in violent fits, in the intervals of which the patient is often but little troubled with it. These fits are particularly apt to occur after he has eaten, especially if he has eaten a great deal, or any thing by which the digestion is disturbed, and on lying down.

In many instances they are most apt to come on when he lies on the left side, sometimes when he lies on the right. I think in almost all cases. they are least apt to occur in the recumbent position, when the patient lies on the back rather inclining to the right with the shoulders a little raised; and it generally happens in the more advanced stages, and often before the strength is much exhausted, that this is the only position in which he can lie without inconvenience. It is common in this form of phthisis, as indeed in all others, for the cough to be troublesome for some time after awaking in the morning. As the disease proceeds, the cough becomes more frequent, returns less decidedly by fits, and is attended with a more copious expectoration. In all these respects there is of course considerable variety in different cases, but in almost all the general character here pointed out may be observed.

The matter expectorated is at first limpid and glairy; by degrees we see intermixed with it small portions of an opake pus-like substance, the proportion of which in the progress of the

disease increases; and in some cases the quantity expectorated is astonishing, often much greater in proportion to the severity of the other symptoms, than in other species of phthisis. I have seen half a pint or more of pus-like matter mixed with tough phlegm expectorated daily, when the other symptoms were comparatively mild.

In other species of phthisis, very copious and long continued expectoration of pus-like matter is less common. In them such copious expectoration generally arises from the bursting of an abscess. The matter it contained, if not sufficient to occasion suffocation, being brought up, the quantity expectorated is again reduced till another abscess bursts.

Bloody expectoration is by no means uncommon in this species of phthisis. Blood often appears early in the disease mixed with the colourless phlegm. After the pus-like expectoration commences, if blood has not previously appeared, it is much less apt to appear than in other forms of the disease. If it appear even in small quantity after this stage commences, the case generally proves fatal.

While the blood is mixed only with a transparent fluid, there may be good hopes of recovery, certainly better than under the same circumstances in any other species of phthisis. A similar observation applies to the pus-like expectoration. If there be no admixture of blood, there may be good hopes of recovery, if the disease has not lasted long; and certainly much better than under the same circumstances in other species of the disease.

The expectorated matter is less apt than in these, to assume a sanious appearance, but when this occurs, it seems to indicate nearly as much danger as in them. If it happen under the proper treatment, there is no hope. Nearly the same may be said of every admixture of pus-like matter and blood occurring under these circumstances.

I here wave all discussion respecting the means of distinguishing pus and mucus. In my treatise on *symptomatic fevers*,* I

* Page 30, *et seq.*, fourth edition. The criterion of pus, proposed by Dr. Young, in his work on *consumptive diseases*, p. 27, if its certainty be admitted, appears to me the best, as it is the most easy of application.

have considered the question at length. It is necessary in practice to have means of judging independent of nice experiments. Whether the matter I call pus-like, be pus or not, is not here the question; it is that to which the observations, which I am about to lay before the reader, apply. The only criteria, which I have found necessary in practice, are its pus-like appearance, and its sinking when so agitated in water as to separate it from the tough mucus, with which it is mixed. I am inclined to think that this substance is almost always real pus But if we know what states of disease are connected with these appearances in the expectorated matter, it is of comparatively little consequence whether what we see be pus or not.

The breathing in the earlier stages of this species of phthisis, is sometimes more oppressed by the recumbent posture, than in other forms of the disease; and is more frequently attended with a sense of tightness across the pit of the stomach. The same observations which apply to the cough in the recumbent position, and after eating apply to the dyspnœa; but it often happens in the early stages, that there is little or no dyspnœa: and there is very rarely, except in the advanced stages, that marked dyspnœa on exercise which so frequenty attends even the commencement of other species of phthisis.

There is often little or no pain. In many cases the patient is subject to a dull pain in the pit of the stomach, or pretty low down in the left side of the chest; more rarely the pain is in the same part in the right side. There is hardly ever a fixed pain high in the chest, except about the shoulders. There, it is not uncommon, and there is frequently an uneasy sensation and a sense of oppression under the sternum.

The patient sometimes complains of darting pains in various parts of the chest, and frequently in more distant parts, particularly in the back and shoulders, and in the legs; and is often subject to head-ach.

The hectic fever is hardly ever completely formed at so early a period as in other species of phthisis, and sometimes there is a copious purulent expectoration with but slight fever, and that not

at all assuming the form of hectic, the skin remaining dry in the morning, and there being little or no evening exacerbation: a state of the symptoms hardly ever observed in other forms of the disease.

The emaciation is seldom so rapid as in other species of phthisis, but seems to keep pace with the state of the fever.

Such is the manner in which the symptoms common to all forms of phthisis are modified in this species of it, but a diagnosis resting merely on the modification of symptoms must always be fallacious; it is therefore fortunate, that in the present instance, there is superadded to the usual symptoms of phthisis, others peculiar to this species, by which, with very little attention, it may always be distinguished; symptoms indicating a deranged state of the digestive organs.

The patient is often distressed with flatulence, acidity, and irregular bowels; the tongue is furred, the appetite, for the most part, contrary to what is usual in other forms of the disease, much impaired. The variety in this respect, however, is considerable. Sometimes there is a false appetite which fails after a few mouthfuls, and a sense of oppression after eating, as if there were not room for what had been taken.

The alvine discharge is seldom well coloured, and the epigastric region, at the part above pointed out, is more or less full and tender on pressure.

In many cases, particularly in those of some continuance, there is a greater degree of fulness and firmness in the right hypochondric region than in the left, often attended with tenderness on pressure. Much less frequently there is some preternatural fulness, and a degree of tenderness in the left hypochondric region also. In health, the feeling given to the hand in examining the two sides, is perfectly similar, as I have ascertained by repeated trials. The liver lying under the ribs, we press on nothing but the muscles and soft bowels on either side.

The above symptoms vary much at different times, but the patient is hardly ever free from them. The connexion between them and the pulmonary symptoms is rendered evident by the

latter increasing with the former, so that when the epigastric region is very full and tender, and the flatulence and acidity more troublesome than usual, the cough and dyspnœa are so also; and on the former symptoms subsiding, the latter likewise abate. Even the rising of wind from the stomach, often for the time, removes the tendency to cough.

The foregoing are the symptoms of the more early stages of this species of phthisis. In its advanced stages, it approaches more and more to other forms of the disease. All the symptoms, which more particularly indicate a tubercular state of the lungs, show themselves; the cough is more constant, and partakes more of the hacking kind, the breathing is more affected by exercise, and the hectic is more completely formed.

According to a law of sympathy, to which I have had frequent occasion to refer, the fulness and tenderness of the epigastric and hypochondric regions, with the various other symptoms indicating derangement of the alimentary canal, now, that the disease is fixed in the lungs, are often lessened, and sometimes wholly disappear; which, if the pulmonary symptoms continue unabated, always, I believe, affords a fatal prognosis.

The patient at length sinks with precisely the same symptoms as in other species of phthisis.

In addition to these, some other of the more prominent consequences of severe affection of the digestive organs sometimes show themselves, particularly dropsy of the belly, which I never knew to supervene in other species of phthisis. A degree of anasarca, the effect of debility, is not uncommon in the latter stages of all its species.

Of the Causes.

The species of phthisis which I am considering arises from all the causes of the other forms of this disease, with the exception of those whose operation is confined to the lungs themselves: the inhaling of dust, other diseases of the lungs, the bones pressing

unequally on them, &c. To compensate for the want of the causes immediately affecting the lungs, we have a numerous set of causes affecting the digestive organs. Drunkards, in particular, at that time of life which disposes to phthisis, frequently fall a sacrifice to this form of the disease. In short, we perceive equally in its causes, as in its symptoms, its connexion with the state of the digestive organs; from which it may be justly termed dyspeptic phthisis.

It particularly deserves attention, that in many families, this form of the disease alone appears. Its fatal effects may generally, I believe, be prevented by carefully avoiding the causes which tend to debilitate the digestive organs; and watching the approach of the symptoms enumerated in the first chapter.

Of the appearances on dissection.

The appearances of the lungs are generally much the same as in other cases of phthisis; but we almost always find at the same time, either a diseased state of the liver, or traces of disease having existed in it. In cases where the disease of the liver has been severe, and the patient has died as much of this disease, as that of the lungs, I have seen those parts of the lungs in the neighbourhood of the liver alone affected, the left side appearing sound or nearly so.

In general, however, the affection of the liver seems to have little immediate share in the cause of death; and the patient lives, as in other cases of phthisis, till almost the whole lungs are rendered incapable of their functions. Here, as in many other cases, we often have occasion to remark to what extent change of structure, even in the vital organs, may go without destroying life, when the change is very slowly effected; a circumstance which, perhaps, more than any other, shows the extent of the resources, by which we are enabled to counteract the more immediate effects of disease.

It is not at all uncommon in dyspeptic phthisis to find the spleen as well as the liver diseased. As the cœliac artery divi-

ding into three branches supplies the liver, stomach, and spleen, may we not suppose that the pain so frequently felt in the left side and in the epigastrium in this form of phthisis, arises from more than the due quantity of blood being thrown into the arteries of the two latter organs, in consequence of the obstructed state of the liver? Is it owing to their being supplied by the same artery, that we so frequently find a diseased state of the liver and spleen in the same subject, and that inflammations of these organs so frequently alternate with each other?

Of the nature of dyspeptic phthisis.

It is impossible to observe even in a cursory manner the symptoms of this disease, without remarking that the state of the lungs is connected with that of the digestive organs. Its causes, we have seen, afford the same inference; and in those who die of it, I have just had occasion to remark, we very frequently find a diseased state, or proofs of a diseased state having existed, in one of the organs of digestion.

A question of the first importance in the treatment of this disease here arises. What is the nature of the relation observed between the affection of the lungs and that of the digestive organs in this species of phthisis? Is the one a consequence of the other, or are they simultaneous affections arising from a common cause? They are not simultaneous affections, for the one almost always evidently precedes the other.

In by far the majority of cases in which both the lungs and digestive organs are affected, the affection of the digestive organs precedes that of the lungs. In some instances we find the affection of the lungs the primary disease. But in these, the case does not assume the form above described, but that of simple phthisis; and the hepatic affection, which is always the most prominent feature of the derangement in the digestive organs when it is complicated with phthisis, does not show itself till a late period of the disease; and then seems only to influence the

symptoms by increasing the oppression and irritation and hastening the fatal termination.

We often observe the first of these forms of the disease arise from causes evidently acting on the digestive organs, and as far as we can perceive, in no degree on the lungs; and the last, from causes evidently acting on the lungs, and in no degree on the digestive organs.

It seems to be a necessary inference from the preceding facts, that a diseased state of either set of organs may produce that of the other. But the tendency of disease to spread from the digestive organs to the lungs is much greater, than that to spread from the latter to the former. We often see a slight degree of derangement in the digestive organs produce cough and other pulmonary symptoms, and derangement seldom exists in all the digestive organs without producing more or less of these symptoms; whereas it is only after disease has advanced very far in the lungs, that it is apt to spread to the digestive organs, and in the greater number of instances it proves fatal without spreading to them.

When to these circumstances we add, that all the peculiarities of those cases of phthisis, which are from the commencement accompanied with disease of the digestive organs, may be easily explained by the existence of this disease; and that, as I shall presently have occasion to point out more at length, every thing which relieves it, at the same time relieves the pulmonary symptoms that attend it, the inference appears to be unavoidable, that in the species of phthisis, which we are considering, the pulmonary disease arises from that of the digestive organs.

It is not to be overlooked, however, that it is in those most disposed to pulmonary disease that affections of the digestive organs most frequently produce it. We consequently see this species of phthisis most apt to occur in the same habit which disposes to other forms of that disease. This would be more uniformly the case, were it not that those who have weak lungs, often have strong digestive organs; an observation as old as Hippocrates. On the other hand, when the digestive organs are naturally weak, or powerful causes of disease in them have existed, particularly

the free use of spirituous liquors, we often see it occurring in habits apparently least disposed to pulmonary disease.

It will place in a clearer light what has been said of the nature of the disease before us, and tend farther to illustrate the observations which have been made on the first and second stages of Indigestion, to take a cursory view of the sympathy which exists between the state of the digestive organs, and the principal seat of derangement in some other diseases. I have already had occasion to refer to a work, which no physician, whatever may be the extent of his experience and the accuracy of his observation, can peruse without advantage, although the modesty of its author has induced him to address it only to those belonging to his own branch of the profession; I mean the work of Mr. Abernethy, entitled "*Surgical Observations on the Constitutional Origin and Treatment of Local Diseases.*"

I believe that experience has led many others to similar views, but no other person has laid them before the public in the way in which Mr. Abernethy has done, and those physicians whose attention has been directed to the same object, must be happy to see in Mr. Abernethy's work, a confirmation of their own observations; and such a confirmation as they were not likely to receive from the work of a physician. The physician's attention is directed to internal disease; there his inquiries naturally begin. Mr. Abernethy's, for a similar reason, began with external disease; and I believe every physician, circumstanced as I was, will feel as I felt on reading his work. I unexpectedly met him on a road where I did not expect to meet a surgeon, but where the assistance of a surgeon was of greater consequence than that of any physician could have been. From local, he was unavoidably carrying on his observations to general, diseases. The sympathies in question so connect them that it was impossible for him to do otherwise. From general, I was, for the same reason, carrying mine on to local, diseases. In the case of dyspeptic phthisis which Mr. Abernethy relates, the reader will find the principle of the treatment which I have employed in that disease for more than sixteen years, as appears from what is said in the last volume

of the edition of my *Treatise on Febrile Diseases*, published in 1804; and the following cases, which occurred to me before I read his work, or was acquainted with his opinions, and which I shall relate as concisely as I can, will afford a confirmation of these opinions and of the practice founded on them in local diseases.

I mention these cases, because, like Mr. Abernethy's case of phthisis, they tend to confirm the accuracy both of his observations and mine; for surely no stronger confirmation can be required of any opinion, than two observers wholly unconnected, setting out from the most opposite quarters, and meeting in the same point. My plans of practice are not precisely the same as Mr. Abernethy's, and in particular the mode of giving mercury in internal disease, which I found most successful, is different from his, but the general principle is the same.

I have already had occasion to allude to the case of a gentleman who laboured under severe pains of the legs, which had been treated unsuccessfully for two years. The digestive organs were deranged, and the epigastric region tender on pressure. A grain of blue pill combined with stomachic and opening medicines was given three or four times a day; and the pains, with his other symptoms, disappeared in a few weeks. A gentleman had sores continually breaking out in various parts of the body, which had proved obstinate, for which he had been advised to go through a regular course of mercury. The digestion was deranged, and the epigastrium tender. He took stomachic and opening medicines, with a grain of calomel every second or third night, and his symptoms disappeared in about a fortnight. A lady, after repeated attacks of illness, remained very weak; glandular swellings appeared in different parts of the body, and it was feared that what is called a general breaking up of the constitution was about to take place. The appetite failed, the bowels were disordered, and the epigastrium was tender. She took sometimes a grain of blue pill two or three times a day, with stomachic and opening medicines, and at other times either a few grains of blue pill, or one grain of calomel, according to the state

of the bowels, every second or third night; no application being made to the glandular swellings, but occasionally two or three leeches when they were tender on pressure. In about three months her complaints disappeared under this plan of treatment, nothing but a depression of spirits remaining, which was removed by change of place.

In one respect Mr. Abernethy's mode of giving mercury in the cases above alluded to, and that to which I have been led in internal disease, arising from the sympathy of other parts with the digestive organs, agree. It is from small and undebilitating quantities that good effects are to be expected in such cases; given otherwise it weakens the digestive organs, and often thus increases the disease.

Mr. Abernethy mentions other internal diseases, particularly those of the head and heart, caused by the deranged state of the digestive organs. I have repeatedly seen his observations on those diseases confirmed; and could relate several cases, to which I have already had occasion to allude, in which the patient had for years laboured under symptoms of *angina pectoris*, and had been treated for this disease, in which the case yielded in a few weeks to minute doses of blue pill combined with stomachic and opening medicines. In such instances we must, of course, suppose, that no organic disease of the heart had yet supervened.

His observations on the brain are well illustrated by two excellent treatises, by Dr. Cheyne,* and Dr. Yeates,† on the *Hydrencephalus Internus*. It seems surprising that the immediate connexion of this disease, with the state of the digestive organs should so long have escaped physicians.

It is not meant that hydrencephalus internus, or any of the other diseases to which I allude, always arises from affections of these organs. In many instances they evidently arise from causes acting on the parts in which they have their seat; but were I to

* *A Second Essay on Hydrocephalus Acutus, or Dropsy in the brain*, by J. Cheyne, M. D., Dublin, 1815.

† *A statement of the Early Symptoms which lead to the Disease termed Water in the Brain*, &c, in a Letter to Martin Wall, Esq. M. D., &c., by G. D. Yeates, &c.; London, 1815.

speak from my own experience, I should say, that in at least five cases of six, this disease arises from the former cause; and that, in all cases, preserving a proper state of the digestive organs is the best means of prevention; for even where it arises from other causes, their tendency to produce it will be greater or less according to the state of these organs.

It is well known that nervous affections will, if I may use the expression, mimic the symptoms of almost every disease, but it does not seem to be generally admitted, although I think we have sufficient proof of the fact, that, if this mimic disease be kept up for a certain length of time, it will be converted into the real disease, let the cause which produced it be what it may. The observations made in the second and third chapters, seem sufficiently to illustrate this part of the subject.

Of the Treatment of Dyspeptic Phthisis.

In speaking of the treatment of this form of phthisis, I shall follow the same plan which was adopted in speaking of its symptoms, confining myself to those circumstances in which it differs from the other species of the disease.

As it appears, both from the symptoms and causes of dyspeptic phthisis, that the affection of the lungs is influenced by the state of the digestive organs, it is reasonable to suppose that the means which tend to improve their functions, will here be a useful auxiliary to those usually employed in phthisis. In Indigestion we have seen that the function of the liver becomes disordered, and at length, some degree of fulness, and sometimes tenderness on pressure, of the right hypochondrium supervene. It is after these symptoms have supervened, as appears from what has been said, that disorder of the digestive organs is apt to affect the lungs; and it is in proportion as we relieve them, that we find the affections of the lungs relieved.

This species of phthisis may be divided into three stages, in which the prognosis and mode of treatment are different.

In the first the affection of the lungs is merely sympathetic, so

that when the cause which produces it is removed, it ceases of course. This stage is distinguished by the short time which the disease has lasted, by the general mildness of the symptoms, the fever in particular being very slight, and by there generally being no expectoration but what the cough itself seems to occasion, consisting of a colourless phlegm, and for the most part in small quantity.

Sometimes what is expectorated is in masses of a tough glairy appearance, and of a blackish hue, as if mixed with a small portion of carbon, which seem to have lain some time in the lungs; the expectoration of which relieves the cough, which, in this case, is seldom very troublesome. This last appearance of the expectorated matter generally indicates the very mildest form of the disease. It is when there is no expectoration, or when it is thin, scanty, and difficult, that the disease is most apt to degenerate into the more alarming forms.

In the second stage of dyspeptic phthisis, the continuance of the sympathetic affection has produced actual disease in the lungs.

There are two ways in which this disease indicates itself. The most frequent is by some degree of inflammation supervening on the surface of some part of the bronchia, or air cells, in consequence of which the expectorated matter begins to be mixed with small portions of a pus-like substance, which gradually increases as the inflammation extends, till the quantity, we have seen, is often astonishingly great.* Sir Everard Home, in a treatise on the properties of pus, has shown how readily irritation of secreting surfaces produces it, independently of any breach of substance. Less frequently small vessels, in consequence of their being debilitated by sympathy with the state of the stomach, analogous to what we have seen sometimes happens in the vessels of the brain, now and then give way, which prevents the inflammatory action, so that the expectorated matter presents no degree of the purulent appearance, but is occasionally mixed with blood.

* The reader will find many good observations on the tendencies of inflammation of the bronchial membrane in Dr. Hasting's late work on this subject.

The symptoms now assume a more formidable character, the tendency to fever in particular is greater; but it seldom, we have seen, completely puts on the form of hectic. In this stage there is either no breach of substance in the lungs, or the little vessels which from time to time give way, soon heal. It seems to be at this period that tubercles generally form. These going on to suppuration and ulceration, or the irritated surface of the bronchia and air-cells becoming ulcerated, the last stage commences, in which dyspeptic phthisis is nearly as fatal, as any other form of the disease.

This stage is indicated by the aggravation of all the symptoms; particularly by the fever assuming more perfectly the form of hectic, and the expectorated matter occasionally containing both a pus-like matter and blood; although it more frequently happens than in other forms of the disease that, where there has been no expectoration of blood at an early period, none appears afterwards. The expectorated matter in different cases, however, assumes all the various appearances observed in the last stage of other forms of phthisis.

In the first stage the disease generally yields readily, except the dyspeptic symptoms are peculiarly obstinate (in which case some degree of them has generally been of long standing, or the patient has suffered from former attacks of the disease,) or there is such a tendency to a tubercular state of the lungs, that the hepatic affection which I have had occasion to observe always shows itself before Indigestion produces phthisis, and this state of the lungs occur almost at the same time.

Such appear to me to be the chief circumstances which sometimes render the disease fatal, even when properly treated, at this early period; but so generally successful is a proper treatment at this period, that it required many years' observation to convince me that it will not always succeed, and to satisfy my mind respecting the causes of its failure. The last of the causes just mentioned, I am convinced, is the most frequent of them. It is evident that when the tendency to tubercles of the lungs is very great, the case approaches to the nature of that form of phthisis which ori-

ginates on the lungs themselves, whose fatal tendency no mode of treatment, however early adopted, will always prevent.

It often adds much to the unfavourable prognosis, to find that the patient has scrophulous enlargement of the more external glands, which is frequently such as can not be seen, but only felt. It will be generally admitted, I believe, that external glandular swellings and suppurations often tend to prevent internal disease. We see in the same family some fall a sacrifice to phthisis, while others, labouring under these swellings escape it. I have seen a person in the last stage of phthisis, saved by the glands of the neck suddenly swelling and suppurating. But that slight enlargement of the external glands, which may rather be felt than seen, while it indicates, is not of sufficient importance to obviate, the tendency to internal disease.

Provided there be no great tendency to tubercles, and the hepatic affection is not unusually obstinate, the first stage of dyspeptic phthisis generally yields to the usual means of relieving the cough and tendency to fever; combined with the milder parts of the treatment of the second stage of Indigestion, particularly such an attention to diet as prevents the stomach being oppressed, and counteracts the inflammatory tendency, keeping up rather a freer action of the bowels than is necessary in health, and taking care, by occasional doses of blue pill or calomel, according as the bowels are more or less easily acted on, to preserve a sufficiently copious and healthy secretion of bile.

I have generally given the mercurial, for the most part one grain of calomel combined with the compound extract of colocynth, when the bowels were languid; in other cases three or four grains of the blue pill, every second or third night, desiring the patient not to go out the next day, till it shall have passed off, and if it does not pass off in a couple of hours after rising, to assist it by an aperient draught. This part of the plan must be pursued till the secretion of bile becomes healthy. It ought then to be discontinued, and resumed, if rendered necessary by the disordered state of this secretion recurring.

By waiting a couple of hours in the morning previous to giving

the opening draught, too great an effect is avoided, and the effect of the mecurial on the liver better secured; both of which is more necessary here, than in the first stage of Indigestion; where we have seen it is often more our object to obtain a very free evacuation, and only the most transitory effect of the mercurial.

The less stimulating stomachic medicines have generally been used, particularly when the appetite was much impaired.

All of this class of medicines which possess any heating quality, have appeared objectionable. Even gentian, so useful in the first stage of Indigestion, seems often to increase the cough and the tenderness of the epigastrium. I have found extract of camomile flowers, combined with small quantities of the powder or oil of carroway, among the best stomachics in such cases; and, unless the strength be much reduced, Epsom salts have appeared to be the best assistant to the cathartic effects of the mercurial.

The latter I have given, as appears from what has just been said, not for the purpose of moving the bowels, but improving the state of the bile, and therefore only in small doses. The tendency to phthisis is a strong additional argument for avoiding as much as possible every thing which tends to impair the vigour of the stomach and bowels.

The second stage of dyspeptic phthisis, requires a plan of treatment essentially different from the foregoing. When the disease has been neglected till this stage commences, which is not unfrequently the case, or we find that notwithstanding the employment of the above means, the sputa begin to assume a purulent appearance, or to be mixed with blood, the tenderness of the epigastrium continuing, and an unhealthy secretion of bile constantly recurring, we may be assured that the foregoing means will probably be ineffectual; and that if time be lost with them till the third stage supervenes, the termination will prove fatal.

The following is the plan which, under such circumstances, I have for many years adopted, and the efficacy of which originally induced me to offer my observations on this subject to the attention of the public. It consists of a combination of the most decisive treatment of the second stage of Indigestion with that of phthisis.

We are here to recollect, that while it is even of greater importance than in simple Indigestion to save the strength, it is of still greater importance to expedite the cure. The most to be apprehended from delay in the former case is an increase in the severity and obstinacy of the dyspeptic symptoms; but in the latter, the structure of the lungs is threatened, and, if the cause of injury can not be removed, will soon be destroyed.

One grain of the blue pill, combined with some mild stomachic, was given two or three times in the course of twenty-four hours, and continued either till the tenderness of the epigastric region yielded, and a proper secretion of bile was restored, or the gums appeared a little redder and fuller than natural.

I have already had occasion to make some observations on the advantages arising from mercury given in minute doses. There is no case in which they are more conspicuous than in that before us. As the tenderness of the right hypochondrium abates, and the state of the alvine discharge improves, in by far the majority of cases the pulmonary symptoms gradually disappear.

With the foregoing plan I have always combined means for the purpose of more directly relieving the tenderness of the hypochondrium. If it be slight, a succession of small blisters applied over the tender part is often sufficient. If considerable, the blisters should be preceded by the loss of from two to four ounces of blood from this part, from which, if there be much hardness of pulse, although the tenderness be not considerable, great advantage generally arises. When the disease is obstinate, or has repeatedly recurred, a permanent discharge from the tender part, especially that by a seton, often essentially promotes the cure.

By these means the quantity of mercury required is much lessened. If the tenderness be very great indeed, no quantity will succeed unless we reduce the inflammatory action.

For the purpose of lessening the quantity of mercury, I have also combined with it such other means as tend to promote a regular and healthy secretion of bile.

The external use of the mineral acids too much disposes to inflammation to be employed in the case before us. Saline aperi-

ents, more or less, promote a due action of the liver, and are, therefore, preferable to other cathartics, provided they are equally suitable in other respects; but of the means which I have employed with this view in dyspeptic phthisis, none has appeared equal to the dandelion. It ought always, perhaps, to be given in some form or other in this disease, if the stomach can bear it in large doses.

When the patient can take a decoction of it poured upon camomile flowers for his common drink; or, what I have found better, can gradually increase the dose of the fresh expressed juice to two or three table spoonfuls, taken in camomile tea, three times a day, its beneficial effects are frequently very striking. If it tends to oppress the stomach, advantage often arises from infusing a few cloves with the camomile flowers. When the dandelion could be given in either of these ways, I have often given only half a grain of the blue pill twice or three times a day, and I think have generally found as much advantage from this dose, as from a whole grain without the dandelion.

I have also, particularly where the pulse was very hard, seen great advantage from giving with the mercurial very small doses, four or five minums, of the tincture of colchicum repeated three or four times a day: and it is of great use in all cases to allay the feverish heat by nitrate of potash or saline draughts.

If neither the tenderness of the epigastrium be removed; nor the gums a little affected by the above plan in about a fortnight, I have gradually increased the quantity of the blue pill till one of these effects took place. If either take place without relieving the pulmonary symptoms, the prognosis is bad. If the tenderness of the epigastrium continue, the hepatic affection is unusually obstinate: if this be wholly removed without materially relieving the pulmonary symptoms, we have reason to believe that the disease has made great progress in the lungs.

It is surprising from what states the lungs will sometimes recover, when relieved from the irritation of the hepatic affection. I have seen many recover not only whose friends, but whose physicians, had lost hope of them. But in these cases the proper

means had not been tried; if these have failed, the hope is no better than in other species of phthisis.

Where the failure of relief proceeds from the obstinacy of the hepatic affection, some hope arises from a fuller mercurial course, but it is often fallacious; for, although such a plan as I have recommended may be pursued without any diminution of strength, and is generally, by relieving the disease, attended with an improvement of it; a freer use of this medicine, if its advantage be not immediately apparent, will generally be found hurtful.

It sometimes happens that the tenderness of the epigastrium is wholly, but the pulmonary symptoms only partially, relieved by the above plan. In this case the hepatic affection is apt to recur, always bringing with it an increase of the pulmonary symptoms, till the structure of the lungs is at length destroyed. Here, if the recurrence of the hepatic affection be neglected, the fatal termination is rapid. If it be carefully watched and relieved as soon as it appears, the case is protracted, and the decline of the patient gradual. I have known cases, where the progress of the disease had by such means been so retarded, that there was little increase in it in the space of several months, prove rapidly fatal on the adoption of another plan.

But the most fatal case is when the hepatic affection finally disappears, the seat of the disease being wholly transferred to the lungs, as happens frequently in the last stage of this species of phthisis. In this case there is no hope; while the hepatic affection continues to recur, there is always some hope, however small, that on its final removal, the lungs may recover.

With respect to the parts of the treatment which are common to dyspeptic and other forms of phthisis, I have little to offer in speaking of the former. The various means found useful in other cases of this disease are applicable here, as far as they do not tend to renew or increase the affection of the digestive organs. I think I have found a combination of the extracts of white poppy and conium, the best anodyne in this form of phthisis. Opium is more inclined to constipate the bowels and retard the due flow of bile, and the anodyne power of the hyoscyamus in such doses

as are safe, is not to be depended on. When the epigastrium is very tender, animal food and fermented liquors are peculiarly injurious.

Some suppose that mercury is often useful in phthisis originating in the lungs. I have never found it so, but I think when it has been employed in such cases on account of other diseases being complicated with them, it has almost always proved hurtful. I have remarked that in this form of the disease it never seems to improve the strength, as it generally does in dyspeptic phthisis, by improving the digestion. In them the digestion is generally good, and we have nothing to compensate for the debilitating effects of the mercury.

If there be any case of idiopathic phthisis in which mercury is proper, it is one which I have already had occasion to mention, in which the pulmonary disease produces disease of the digestive organs; of which we still find hepatic affection the prominent feature, and which always tends to aggravate the original disease. I have not, however, found it useful in such cases, which I think may be easily explained. In them the pulmonary affection is far advanced before the affection of the digestive organs appears, and both on this account and because the former is the original disease, it can not be removed by removing the latter. Besides, it is not likely that small doses of mercury will remove the hepatic disease, while the cause which produced it still continues to operate; and large doses, if they are capable of removing it, are here out of the question.

If what has been said in the foregoing observations on dyspeptic phthisis be correct, the principle of treatment in other organic diseases which have a similar origin may easily be inferred.

We must combine the treatment of Indigestion with that necessary in the disease which has supervened on it, in such a way as never to lose sight of the former; for, however much the affection of the digestive organs may be relieved by the establishment of another disease, it is always apt to recur; and as far as I have observed, the recurrence of the primary, rarely tends to relieve, and generally aggravates the symptomatic, disease.

SECTION II.

Of Habitual Asthma.

I HAVE already had occasion to make some observations on this disease, and to mention generally the means of relief which I have found most effectual.

We have seen that Indigestion sometimes so affects the nervous system, or some particular part of it, that permanent debility, either general or partial, and that with little or no affection of the sanguiferous system, ensues.

This is particularly apt to happen in the lungs when Indigestion has been long attended with a considerable degree of dyspnœa. In such cases, I have already had occasion to observe, the dyspnœa with a tendency to cough sometimes remains after all the other symptoms have disappeared, and is often but little influenced by medicine.

It appears from experiments related in an *Inquiry into the Laws of the Vital functions*, to which I have frequently had occasion to refer, that after the nervous influence of the lungs and stomach has been greatly impaired by dividing the eighth pair of nerves, and folding back one of their divided ends, in consequence of which digestion is suspended, and the breathing rendered difficult, the animal can be made to breathe with freedom and digest his food by sending the galvanic influence through the lungs and stomach.*

* See an account of a repetition of the above experiments, with a confirmation of their results, in the *Medical and Physical Journal for May*, 1820, by Clarke Abel, M. D., F. R. S., &c.

Since the publication of the first edition of this Treatise these experiments have again been repeated, in consequence of several gentlemen still thinking that their results required further confirmation. The following is the very candid account given by one of these gentlemen, Mr. Broughton, in the twenty-second number of the *Journal of the Royal Institution*, pp. 326, 7.

Having stated that the eighth pair of nerves had been divided in the neck of three rabbits, pains having been taken to keep their divided extremities asunder, and one of the rabbits subjected to the influence of the voltaic battery in the way above pointed out, he observes:

"The galvanised rabbit had remained singularly quiet the whole time,

It is an inference from my own experiments and observations,* as well as those of others, particularly of M. le Gallois, that what is called the nervous system, comprehends two distinct systems, the sensorial, and the nervous system properly so called. Now, we have no reason to believe that galvanism can perform any of the functions of the sensorial system; yet, in the greater number of instances in which it has been used in medicine, it has been expected to restore the sensorial power. It has been expected to restore hearing, and sight, and voluntary power. It may now and then happen in favourable cases, from the connexion which subsists between the sensorial and nervous systems, that by rousing the energy of the latter, we may excite the former; or the sensorial power may be entire, and the fault in the nerves which convey its influence. From our experience of such cases, however, there seems little reason to hope that galvanism will often be successful in them. We have reason to believe, from

breathing freely, and with no more apparent distress than the twitches usually produced by the galvanic influence, which in this case was uninterruptedly kept up. The other rabbits laboured strongly in their breathing. They were all three killed at the same period, and their stomachs successively opened. In the two non-galvanised rabbits, digestion had *scarcely made any progress*, but in that galvanised, it was perfect, in the manner, to all appearance, avowed by Dr. Wilson Philip and his supporters. However we may differ in opinion, as to the real state of the food in the non-galvanised rabbits, as to Dr. Wilson Philip's theory, or, as to the cause of the formation of chyme and chyle being found under the influence of a galvanic battery, Dr. Wilson Philip can not be denied the merit of correctness in his assertions (hitherto almost universally distrusted,) relative to the simple fact of a certain power of galvanism producing digestion, after dividing the eighth pair of nerves, under circumstances in which it is impeded without the galvanism.

"It is proper to state that the President and several members of the Royal Society, and of the colleges of physicians and surgeons, among whom were Mr. Brodie and myself, inspected the progress of these experiments, which were carried on under the constant superintendance of Dr. Wilson Philip."

Mr. Broughton also admits that the experiments afforded reason to believe that the nervous influence passed by nerves after they had been divided; and it has from experiments since made been admitted by Mr. Brodie and Mr. Cutler, the gentleman who was so good as to assist me in these experiments, that this may happen although the divided ends be separated by the distance of a quarter of an inch, provided the nerves be not otherwise displaced.—See a paper relating to this subject in the twenty-third number of the *Journal of the Royal Institution.*

* See *Experimental Inquiry,* chap. X., and the experiments there referred to.

the experiments related in the Inquiry just referred to, that galvanism has no other power over the muscular system than that of a stimulus;* we are, therefore, to expect little more advantage from it in diseases depending chiefly on faults of the sanguiferous system, than from other stimuli, &c. But I can not help regarding it as almost ascertained, that in those diseases in which the original cause of derangement is in the nervous system properly so called, where the sensorial functions are entire, and the vessels healthy, and the power of secretion, which seems immediately to depend on the nervous system, is alone in fault, galvanism will often prove a valuable means of relief.

As soon as the foregoing view of the subject presented itself, I was led to inquire what diseases depend on a failure of nervous influence. The effect on the stomach and lungs, of dividing the eighth pair of nerves,† answered the question respecting two of the most important diseases of this class. We have seen, that withdrawing a considerable part of the nervous influence from the stomach and lungs suspends the digestive powers, and produces great difficulty of breathing. The following observations relate chiefly to affections of the lungs. Of the effects of galvanism in disordered digestion, the principal experience which I have had, has been in cases where it was complicated with asthmatic breathing.

When the effect of depriving the lungs of a considerable part of their nervous influence is carefully attended to, it will be found, I think, in all respects, similar to the dyspnœa which often attends Indigestion, and which, when it remains after the other symptoms have disappeared, I have called habitual asthma.

In this disease the breathing is constantly oppressed, better and worse at different times, but never free, and often, we have seen, continues to get worse in defiance of every means we can employ.

* Compare the experiments related in the first and second chapters of this part of the Inquiry with Exp. 70, 71, 72, 73, and the observations which follow them.

† *Exp. Inq.* Exp. 44, 45.

It appeared from repeated trials, that both the oppressed breathing, and the collection of phlegm, caused by the division of the eighth pair of nerves, may be prevented by sending the galvanic influence through the lungs.* That this may be done with safety in the human body we know from numberless instances, in which galvanism has been applied to it in every possible way.

Such are the circumstances which led me to expect relief from galvanism in habitual asthma. Although its effects in this disease have been witnessed by other medical men, I shall mention nothing in the following pages which did not come under my own observation.

I have employed galvanism in many cases of habitual asthma, and almost uniformly with relief; and have found the affection of the breathing as readily relieved when it appeared as a primary disease, as when it succeeded to indigestion.

The time, during which the galvanism was applied before the patient said that his breathing was easy, has varied from five minutes to a quarter of an hour. I speak of its application in as great a degree as the patient could bear without complaint. For this effect I latterly found from eight to sixteen four-inch plates of zinc and copper, the fluid employed being one part of muriatic acid, and a hundred and twenty of water, sufficient. Some require more than sixteen plates, and a few can not bear so many as eight; for the sensibility of different individuals to galvanism is very different. It is curious and not easily accounted for, that a considerable power, that, perhaps, of twenty-five or thirty plates, is often necessary on first applying the galvanism, in order to excite any sensation; yet, after the sensation is once excited, the patient shall not, perhaps, particularly at first, be able to bear more than six or eight plates.

The stronger the sensation excited, the more speedy in general is the relief. I have known the breathing instantly relieved by a very strong power. It has generally been made a rule to begin with a very weak one, and increase it gradually at the patient's

* Exp. 70, 71, 72, 73.

request, by moving one of the wires from one division of the trough to another, and moving it back again when he complained of the sensation being too strong. It is convenient for this purpose to charge with the fluid about thirty plates.

The galvanism was applied in the following manner. Two thin plates of metal, about two or three inches in diameter, dipped in water, were applied, one to the nape of the neck, the other to the lower part of the epigastric region. The wires, from the different ends of the trough,* were brought into contact with these plates, and as observed above, as great a galvanic power maintained, as the patient could bear without complaint. In this way the galvanic influence was sent through the lungs as much as possible, in the direction of their nerves. It is proper, constantly to move the wires upon the metal plates, particularly the negative wire, otherwise the cuticle is injured in the places on which they rest. The relief seemed much the same, whether the positive wire was applied to the nape of the neck, or the pit of the stomach. The negative wire generally excites the strongest sensation. Some patients thought, that the relief was most speedy, when it was applied to the epigastric region.

The galvanism was discontinued as soon as the patient said that his breathing was easy. In the first cases in which I used it, I sometimes prolonged its application for a quarter of an hour,

* I found a trough, of the old construction, more effectual in restoring the due action of the lungs than the improved pile. I was at first at a loss to account for this circumstance: from many observations, I have now reason to believe, that it arises from such effects of galvanism, like its other effects on the animal body, being proportioned, less to the quantity of electricity supplied by the trough, than to the intensity of its electrical and quantity of its chemical power, both of which are proportioned rather to the number of plates, than to the extent of surface.

I have repeatedly tried the effects of a powerful electrical machine, in habitual asthma. They are considerable, but inferior to those of the voltaic trough: which I would ascribe to the former possessing much less chemical power, in proportion to the intensity of its electricity, than the latter. The most powerful electrical battery will not readily decompose water without the ingenious arrangement suggested by Dr. Wollaston, for concentrating, as much as possible, its electrical power; while the power of a few voltaic plates is, without any precaution, sufficient for this purpose.

I have latterly found a trough, composed of plates two inches by three, nearly, or altogether, as effectual as one of plates four inches square.

There is reason to believe that plates of an inch and half or two inches square, would answer medical purposes nearly as well as larger ones.

or twenty minutes, after the patient said he was perfectly relieved, in the hope of preventing the early recurrence of the dyspnœa; but I did not find that it had this effect.

It is remarkable, that in several who had laboured under oppressed breathing for from ten to twenty years, it gave relief quite as readily as in more recent cases; which proves, that this habitual difficulty of breathing, even in the most protracted cases, is not ascribable to any change having taken place in the more evident mechanism of the lungs.

With regard to that form of asthma which returns in violent paroxysms, with intervals of perfectly free breathing, I should expect little advantage from galvanism in it, because as I have just observed, I found that the peculiar difficulty of breathing, which occurs in this species of asthma, can not be induced in animals, by diminishing the nervous influence of the lungs. It is probable, that in the human subject the cause of this disease is spasm, from which, indeed, it takes its name; and we have no reason to believe, from what we know of the nature of galvanism, that it will prove the means of relieving any affection of this kind.

Galvanism is sometimes useful in protracted cases of spasmodic asthma, when the fits have become less severe and more or less difficulty of breathing is almost constantly present; in short, when the spasmodic has assumed a good deal of the form of habitual asthma. Even in these cases, however, as far as my experience has gone, the relief afforded by it is very imperfect, and of short duration. It is often such, however, as very sensibly aids other means.

The spasmodic asthma is comparatively a rare disease, not one case of it occurring for at least fifty of habitual asthma.

Of the first cases of habitual asthma, which I saw, many occurred in work-people of the city where I then resided, who had been obliged to abandon their employments in consequence of it, and some of them, from its long continuance, without any hope of returning to regular work. Most of them had tried the usual means in vain. By the use of galvanism they were relieved in different degrees, but all sufficiently to be restored to their em-

ployments. I afterwards saw several of them, who although they had not used galvanism for many months, said they had continued to work without inconvenience. Some, in whom the disease had been wholly removed, remained quite free from it; some had had a return of it, and derived the same advantage from galvanism as at first.

The application of galvanism was confined to asthmatic dyspnœa. In all inflammatory cases it would be injurious; and, in cases arising from dropsy, or any other mechanical impediment, little or nothing, it is evident, is to be expected from it.

If the secretion of bile continue to be disordered, and there is tenderness on pressure in the hypochondric region, the means which have been pointed out in the third chapter must be employed for the purpose of relieving these symptoms previous to the use of galvanism; and to these means alone the dyspnœa sometimes yields; but I have learned from a pretty extensive experience, that in a large majority of such cases it will resist them, yet readily admit of relief from galvanism.

If there be little tendency to inflammation, galvanism is also a means of relieving the affection of the digestive organs. In all the cases where habitual asthma was complicated with symptoms of Indigestion, the latter as well as the former were relieved by it. I have repeatedly seen from it the same effect on the biliary system which arises from calomel, a copious bilious discharge from the bowels coming on within a few hours after its employment. This seldom happens except where there appears to have been a failure in the secreting power of the liver, or a defective action in the gall tubes.

I have not found that the presence even of a severe cough, which is common in habitual asthma, in which there is always more or less cough, counter-indicates the use of galvanism. The cough, under its use, generally becomes less frequent in proportion as the accumulation of phlegm in the lungs is prevented; but it seems to have no direct effect in allaying it. During the application of the galvanism the patient is often excited to cough up the phlegm, which is oppressing the lungs. It frequently, however, disappears without being coughed up.

In some cases the cough continued troublesome after the dyspnœa had disappeared. Galvanism never appeared to increase it, except when the inflammatory diathesis was considerable. In the most chronic forms of phthisis, where the symptoms had lasted for several years and habitual asthma had supervened, I have seen the relief obtained from galvanism very great, notwithstanding some admixture of a pus-like substance in what was expectorated. In these cases it relieves the breathing, leaving the other symptoms little changed. I need hardly add, after what has been said, that in ordinary cases of phthisis nothing could be more improper than the use of galvanism.

The dyspnœa arising from phthisis and that from habitual asthma are easily distinguished. The former is less variable. It is generally increased by the exacerbations of the fever, and always by exercise. When the patient is still and cool, except in the last stages of phthisis, his breathing is generally pretty easy; and is seldom much influenced by changes of the weather, except they increase the inflammatory tendency. The latter is worst at particular times of the day, and frequently becomes better and worse without any evident cause. At the times when it is better the patient can often use exercise without materially increasing it. Its exacerbations are unaccompanied by any increase of fever. Changes of the weather influence it much. It is particularly apt to be increased by close and foggy weather.

When there is a considerable tendency to inflammation in habitual asthma, the repeated application of galvanism sometimes increases it so much, that the use of this influence no longer gives relief, till the inflammatory tendency is subdued by local bloodletting. It always gives relief most readily, and the relief is generally most permanent in those cases which are most free from inflammatory tendency, and least complicated with other diseases, the chief complaint being a sense of tightness across the region of the stomach, impeding the breathing. The patients remarked that the sense of tightness gradually abated, while they were under the influence of the galvanism, and that as this happened their breathing became free. The abatement of the tight-

ness is often attended with a sense of warmth in the stomach, which seems to come in its place. This sensation is most frequently felt when the negative wire is applied near the pit of the stomach, but the relief does not seem less when it is not felt.

With respect to the continuance of the relief obtained by galvanism, it is different in different cases; in the most severe cases it does not last so long as in those where the symptoms are slighter, though of equal continuance. This observation, however, does not universally apply. When the patient is galvanised in the morning, he generally feels its good effects more or less till next morning. In almost all, the repetition of the galvanism gradually increases the degree of permanent relief, but its increase is much more rapid in some cases than in others.

The permanency of its good effect in the disease before us, has appeared very remarkable in several cases where the symptoms, after having been removed by it, were renewed after intervals of different duration, by cold or other causes. In these cases, means which previous to the use of galvanism, had failed to give relief, were now successful without its aid; or with few applications of it compared with those which had been necessary in the first instance. I have not yet seen any case, in which galvanism had been of considerable advantage, where its good effects appeared to have been wholly lost. Taking cold and the excessive use of ferment ed liquors having been the principal causes of relapse.

The galvanism has seldom been used more than once a day. In some of the more severe cases it was used morning and evening. About a sixth part of those who have used it appear, as far as I yet know, to have obtained a radical cure. It in no cases failed to give more or less relief, provided there was little inflammatory tendency. It failed to give considerable relief only in about one-tenth; I may add, that were it only the means of present relief, we have reason to believe that, being more innocent, it would be found preferable to the heating, spiritous and soporific medicines, which are so constantly employed in this disease.

As a very small galvanic power, that of not more than from

four to six three-inch double plates, often relieved the dyspnœa, may we not hope that a galvanic apparatus may be constructed, which can be worn by the patient, of sufficient power to prevent its recurrence in some of the cases in which the occasional use of the remedy does not produce a radical cure?

I wished to try if the impression on the mind, in the employment of galvanism, has any share in the relief obtained from it. I found that by scratching the skin with the sharp end of a wire, I could produce a sensation so similar to that excited by galvanism, that those who had most frequently been subjected to this influence were deceived by it. By this method, and arranging the trough, pieces of metal, &c., as useful, I deceived several who had formerly received relief from galvanism, and also several who had not yet used it. All of them said that they experienced no relief from what was done.

Without allowing them to rise, I substituted for this process the real application of galvanism, merely by immersing in the trough without their knowledge, one end of the wire with which I had scratched the nape of the neck, the wire at the pit of the stomach having been all the time applied as usual by the patients themselves. Before the application of the galvanism had been continued as long as the previous process, they all said they were relieved. I relate the particulars of the two following experiments, because they point out two circumstances of importance, in the application of galvanism in asthmatic cases, and in judging of its *modus operandi*.

The first was made on an intelligent lady, of about thirty-five years of age, who had for many years laboured under habitual asthma. Her breathing was very much oppressed at the time that she first used galvanism. The immediate effect was, that she breathed with ease. She said she had not breathed so well for many years. Part of the relief she obtained proved permanent, and when she was galvanised once a day for about ten minutes, she suffered little dyspnœa at any time. After she had been galvanised for eight or ten days, I deceived her in the manner just mentioned. The deception was complete. She told

me to increase or lessen the force of the galvanism, as she was accustomed to do, according to the sensation it produced. I obeyed her directions by increasing or lessening the force with which I scratched the neck with the wire. After I had done this for five minutes, she said the galvanism did not relieve her as usual, and that she felt the state of her breathing the same as when the operation was begun. I then allowed the galvanism to pass through the chest, but only through the upper part of it, the wire in front being applied about the middle of the sternum. She soon said that she felt a little relief; but although it was continued in this way for ten minutes, the relief was imperfect. I then directed her to apply the wire in front to the usual place, so that the influence might pass through the whole extent of the chest; and, in a minute and a half, she said her breathing was easy, and that she now experienced the whole of the effect of the former applications of the remedy.

To try how far the effect of galvanism in asthma arises merely its stimulating the spinal marrow, in a young woman who had been several times galvanised in the usual way, the wires were applied to the nape of the neck and small of the back, and thus the galvanic influence was sent along the spine for nearly a quarter of an hour. She said her breathing was easier, but not so much so as on the former application of the galvanism; and on attempting to walk up stairs she began to pant, and found her breathing, when she had gone about half way, as difficult as before the galvanism was applied. She was then galvanised in the usual way for five minutes: she now said her breathing was quite easy, and she walked up the whole of the stairs without bringing on any degree of panting, or feeling any dyspnœa. The above experiment was made in the presence of four medical gentlemen. This patient, after remaining free from her disease for about half a year, returned to the Infirmary, labouring under a slighter degree of it, and experienced immediate relief from galvanism. The disease seemed to have been renewed by cold, which had at the same time produced other complaints. This is one of the cases above alluded to in speaking of the permanency of the good effects

of galvanism. On the return of this patient to the Infirmary, two or three applications of galvanism, combined with means which had given no permanent relief to the dsypnœa previous to her first using galvanism, now soon removed it. When she first used this remedy, it required its constant employment once or twice a day for several weeks to produce the same effect.

Many medical gentlemen, I have already had occasion to observe, have frequently witnessed the relief afforded by galvanism in habitual asthma; and Mr. Cole, the house surgeon of the Worcester Infirmary, authorizes me to say, that no other means there employed have been equally efficacious in relieving this disease.

In the foregoing account of habitual asthma, I have entered more fully than would otherwise have been necessary, into the diagnostic symptoms of this disease; because it has not, in general, been particularly distinguished from other species of dyspnœa; nor indeed considered as a distinct disease, although it often appears as such.

Observations similar to the foregoing respecting the use of galvanism, there is reason to believe, will be found to apply to other cases of Indigestion; but as I observed above, I can not speak with the same certainty of its effects in these cases, having made but few trials of galvanism in this disease, except where it was complicated with habitual asthma, the removal of which, by enabling the patient to use exercise,* no doubt contributed to a more healthy action of the digestive organs, which always ensued when these organs had been deranged, which was generally the case, this disease much more rarely appearing as an idiopathic affection, than as the consequence of Indigestion.

In some, galvanism, at the time of its application, occasions a tendency to sighing; and in some, in whom it removed the dyspnœa, it seemed to occasion a permanent sense of sinking referred to the pit of the stomach. This was easily relieved by small doses of carbonate of iron and bitters, without any return of the dyspnœa.

* The effect of indolence, in painful diseases, is often much less injurious than in health. Pain, if not so great as to overpower, in some degree, comes in place of exercise, in preserving the general activity of the functions.

It generally gave a great degree of relief to the dyspnœa, when it produced this effect.

In the *Inquiry into the Laws of the Vital Functions*, to which I have frequently referred, the reader will find cases related in which habitual asthma was relieved by galvanism, and some in which it wholly removed this disease.

THE END.

The use of mercury – p. 110–115. 124–8.

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